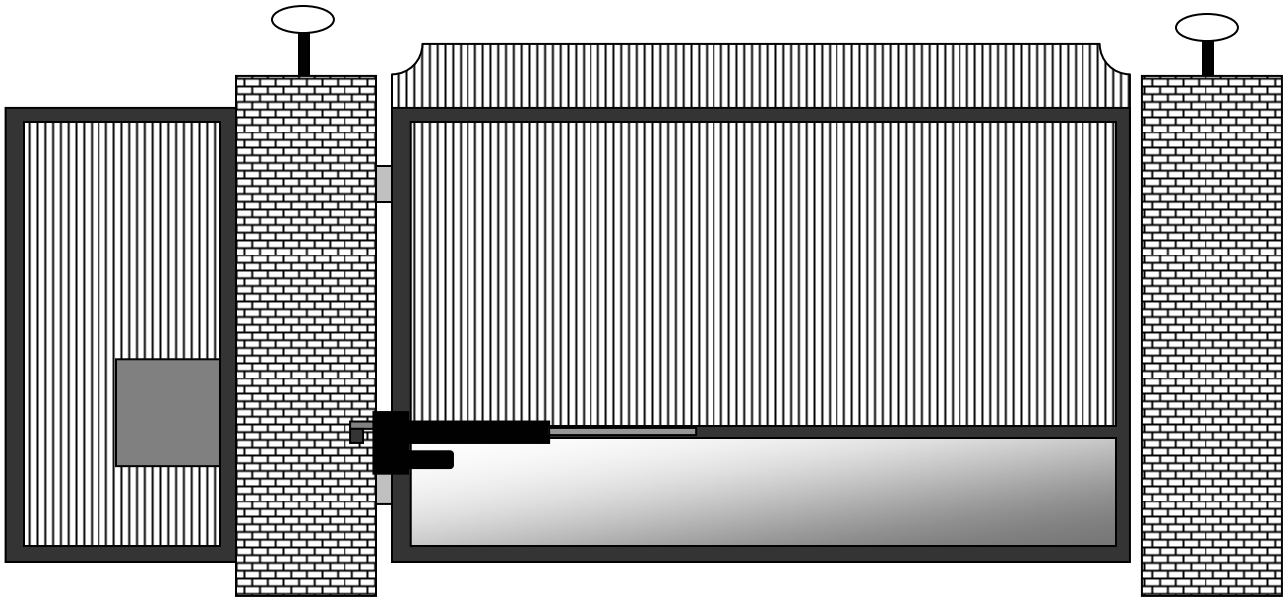
USAutomatic

PATRIOT

High Quality Low Voltage
Vehicular Swing Gate Operator
Solar or AC Charged



PATRIOT I Single Swing Gate Operator

PATRIOT II Dual Swing Gate Operator

Installation/Owners Manual

PROUDLY MADE IN THE USA

www.usautomatic.com

INTRODUCTION

This operator is intended to be installed on vehicular Class I or Class II gates as defined by UL 325. Maximum gate load not to exceed 650 pounds.

PLEASE READ THIS ENTIRE MANUAL CAREFULLY PRIOR TO INSTALLATION. In doing so, along with performance of the installation in step-by-step order, you will achieve optimal results. We strongly recommend that all installation and service personnel pay particularly close attention to the safety systems section of this manual and UL 325. In addition to the current sense feature that is provided, other safety devices are necessary to make each particular installation as safe as possible to reduce the risk of personal injury and/or property damage. A trained and authorized service technician or the factory should be consulted for assistance.

Cautions - Very Important

- ⇨ Do not attempt to enter the gate area while the gate is moving. Wait until the gate comes to a complete stop.
- ⇨ Operate the gate only when it is fully visible, free of persons or obstructions, and properly adjusted.
- ⇨ Do not allow children to play in the area of the gate. Do not allow anyone to ride on the gate.
- ⇨ Do not allow children to play with the remote control or any other activation device.
- ⇨ Do not attempt to "beat the gate" while the gate is opening or closing. This is extremely dangerous.
- ⇨ Test the current sense feature and all safety devices regularly to insure correct operation.
- ⇨ Study the entire Safety Section (page 17-20), paying particularly close attention to the Entrapment zones on page 18-20 and be aware of these areas not only during use but also during any adjustments to the unit.
- ⇨ The USAutomatic battery charger is designed to operate with 12 vdc deep cycle batteries rated at 60-amp hour minimum. Gel type is recommended.
- ⇨ **Modifying the charger AC supply cord will void the charger warranty.**

Other Safety Standards

- ⇨ All control stations should be located at least 6 feet from any moving part of the gate or operator.
- ⇨ Do not ever install any control device where a user will be tempted to reach through the gate or fence to activate a gate.

© USAutomatic, LTD - 2005 rev ZJ
All rights reserved. No part of this may be reproduced by any means
without the expressed written consent of the publisher.

Table Of Contents

Page

Introduction....1
Table of Contents....2
General Requirements/Gate Qualifications & Applications....3
Importance of a Properly Designed Gate....4
Mounting Site Review....4
Parts Included List....5
Hinge Mount Tube Installation/Pull to Open/Push to Open....6
Hinge Mount Tube Installation/Vertical Height....7
Preparation of Actuator for Installation....8
Actuator Installation....8,9
Mounting the Gate Bracket/Control Box/Actuator Cable Splicing 9
Master/Slave Dual Gate Wiring/Push to Open Applications....10
Charging Source Installation/Solar or AC....11
Installing Safety Placards/Secondary Entrapment Siren....11
Final Adjustments Current Sense Adjust....12
Limit Switches/Limit Assembly Operation....13
Circuit Board & Terminal Description....14
Function of Programming Switch Settings DS1....15
Function of Programming Switch Settings DS2....16
Emergency Manual Release....16
Safety Section....17-20
Periodic Service....21
Troubleshooting Introduction....21
Troubleshooting Guide....21-26
Accessory Wiring Diagrams....27-29
Programming Transmitter / Receiver....29
Magnetic Wire Sensing Loops....30-32
Warranty Statement / Mail in Registration....Back Cover

GENERAL REQUIREMENTS

General hand/tools such as combination wrenches, tape measure, level, clamps, etc. are required. Your particular installation may require a drill or other hardware not provided. Welding by a qualified welder is the recommended method of securing the linear actuator mounts to the gate and hinge post. Bolt on brackets is an option, but they must be very securely attached (i.e. carriage bolts with lock nuts and washers). Lag type bolts are not recommended. Loose or unstable operator mounts will result in improper operation.

BATTERY REQUIRED FOR OPERATION (NOT INCLUDED).

We recommend a 12-volt deep cycle gel battery rated at a minimum of 60-amp hours. The actuator harness is equipped with ring terminals designed to connect to bolt type battery post. The USAutomatic charger is designed for this type of battery and using a smaller amp hour battery may cause damage to the charging system.

IMPORTANT CAUTIONS:

1. Do not test or operate this unit without the actuator securely attached to the gate. Serious damage to the actuator limit switch assembly may occur if attempted.
2. Do not perform any welding with the actuator cable plugged into the control board or the battery connected. Serious damage to the control board and/or battery will occur if attempted.
3. Always disconnect the battery power from the unit prior to connecting any devices.

GATE QUALIFICATIONS/APPLICATIONS

GATE LENGTH/WEIGHT

This gate operator is rated for vehicular class I or class II swing gates up to 16 feet in length and up to 650 pounds in weight as defined by UL325. If your gate exceeds either one of these limits, please consult a qualified technician or the factory for alternative solutions. (Example: Convert one 20' gate into two 10' gates and use a dual gate operator.)

Note: *The total gate opening normally cannot exceed 110 degrees. Consult a service technician or the factory if greater opening is required.*

GATE CYCLES PER DAY

Solar charged systems are limited on the number of cycles they can provide on a daily basis. System design must consider stand-by current consumption of all accessories and number of cycles expected per day. Using solar friendly accessories a solar operator in most installations will not need additional solar panels. Contact the factory for help designing the system. This actuator type opener, whether AC or Solar charged, should never be used in applications, which exceed 150 complete open/close cycles per day. Holding the gate open can decrease cycles during high cycle time periods. If more cycles are required, a high traffic gate opener should be used.

IMPORTANCE OF A PROPERLY DESIGNED GATE

As a general rule a gate, which is to be automatically operated must be stronger and smoother than one, which will be manually operated. Since the gate is a major component of the system, great care and concern must be given to the gate design.

A GATE OPERATOR CANNOT OVERCOME A POORLY DESIGNED GATE.

A. Does the gate swing smoothly without binds or excessive resistance? Swing gates should swing level and plumb to prevent the operator from having to lift the gate open or closed. Swing gates should not require a wheel to support them. Wheels usually create drag, which will cause operator problems. A wheel is generally a sign of a weak hinge system or a weak gate frame.

B. Is the gate frame of substantial strength without excessive weight? Will the frame withstand normal wind load conditions without sway or vibration? Will the gate close correctly without being hand-guided or lifted to close?

C. Are the hinges suited for the number of cycles expected per day? We recommend bearing type hinges to reduce friction drag.

D. Will a reinforcement brace be required to attach the operator to the gate or does a suitable cross member exist in the gate design?

If any of these problems exist, they must be corrected to achieve a reliable automatic gate system.

MOUNTING SITE REVIEW

Installers should ask themselves these questions prior to installation and predetermine the solution to any problems, which may occur.

A. Does sufficient space exist for mounting and future servicing of the operator and control box?

B. Will the unit push the gate open to the outside or pull the gate open to the inside?

C. How will the actuator mounts be secured at the hinge and to the gate?

D. How will the control box be mounted securely enough to support the weight of the battery and can it be located within 8 feet to prevent splicing of the actuator cable?

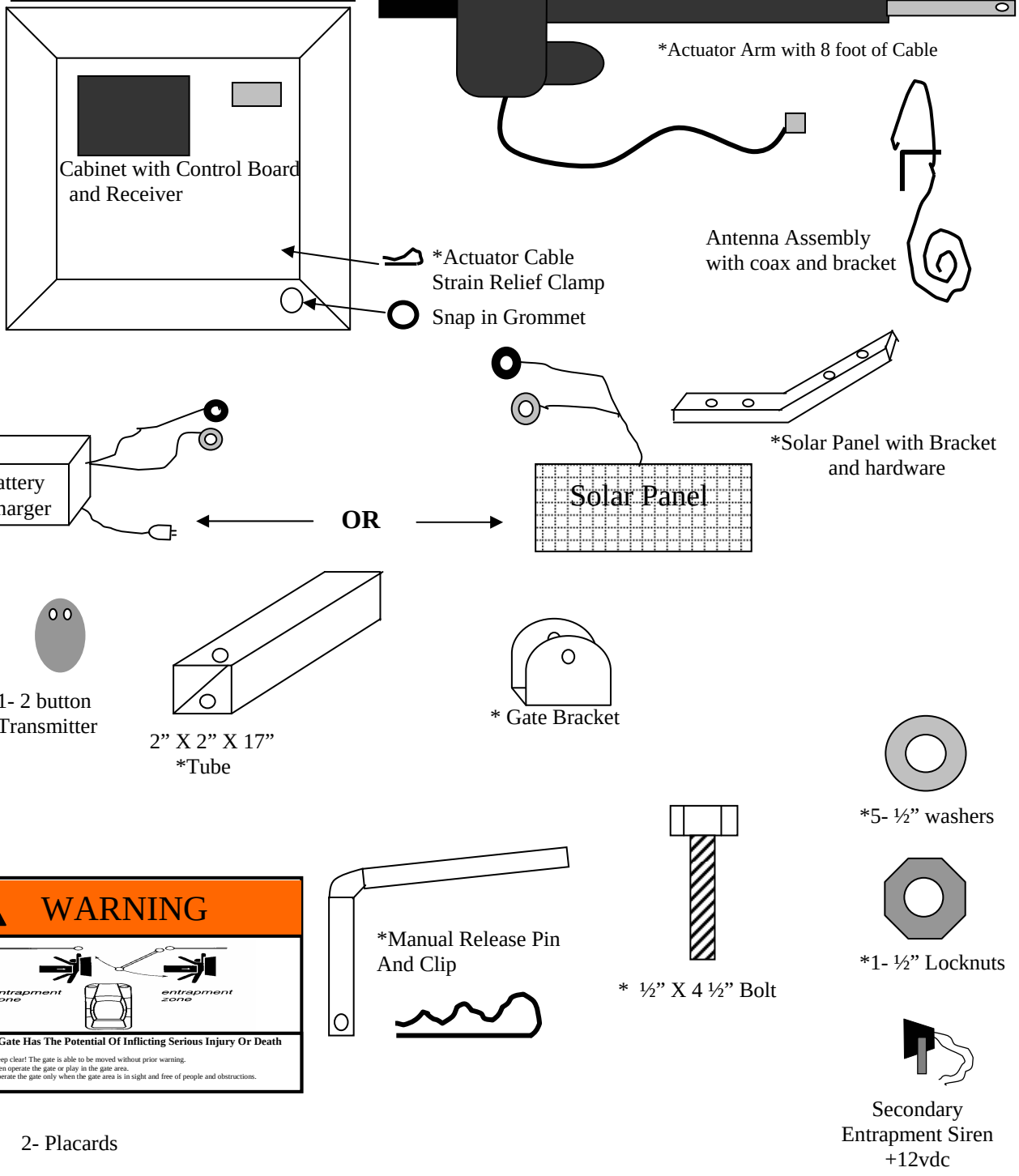
E. How will power be brought to the control box if AC charged?

F. How and where will the solar panel mount if solar charged so that optimum sunlight is received?

G. How will exterior control wiring, if any, be brought to the control box?

H. Have all safety concerns been addressed? (See Safety Section Pgs. 17-20)

PARTS INCLUDED


*Actuator Arm with 8 foot of Cable
Cabinet with Control Board
and Receiver
Antenna Assembly
with coax and bracket
*Actuator Cable
Strain Relief Clamp
Snap in Grommet
Battery
Charger
OR
Solar Panel
*Solar Panel with Bracket
and hardware
1- 2 button
Transmitter
2" X 2" X 17"
*Tube
* Gate Bracket
*5- ½" washers
WARNING
A Moving Gate Has The Potential Of Inflicting Serious Injury Or Death
Persons are to keep clear! The gate is able to be moved without prior warning.
Do not let children operate the gate or play in the gate area.
Persons are to operate the gate only when the gate area is in sight and free of people and obstructions.
*Manual Release Pin
And Clip
* ½" X 4 ½" Bolt
*1- ½" Locknuts
2- Placards
Secondary
Entrapment Siren
+12vdc

- ***For Patriot II quantity is doubled.**
- **Additionally, 40' of Master/Slave Actuator cable provided with the Patriot II**
- **Placards (Two supplied) should be visible from inside and outside of gate.**

NOTE: ***12 Volt DC deep cycle battery 60-amp hour minimum required. (Not Included)***

STEP 1 Hinge Mount Tube Installation (Part 1)

PULL TO OPEN / TOP VIEW (SEE BOTTOM OF PAGE FOR PUSH TO OPEN)

(Left-handed installation shown. Reverse for right-handed installation)

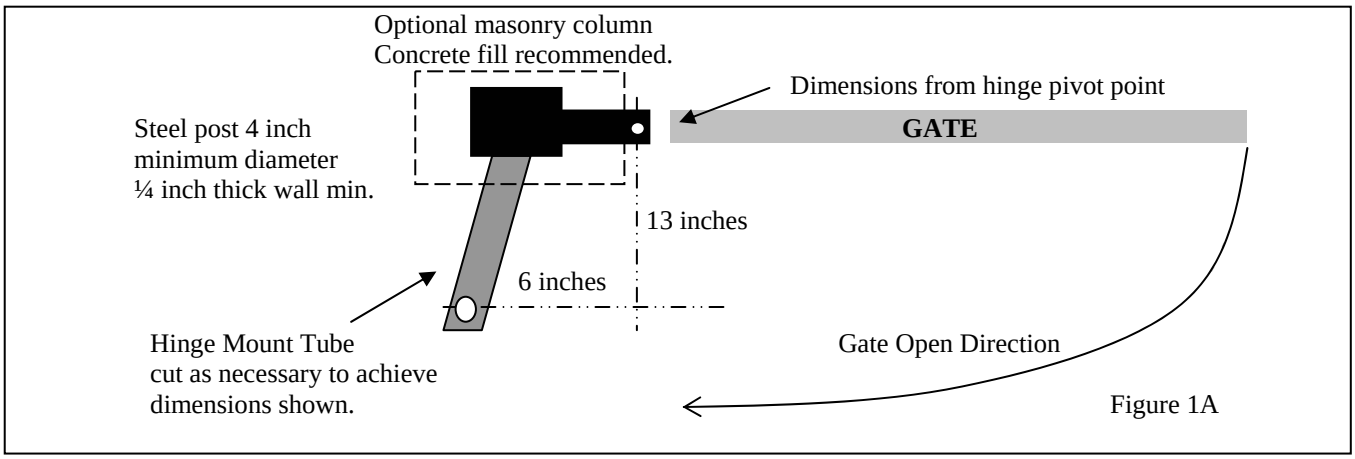


Figure 1A

Other Typical Methods for

Pull to Open Applications **Push to Open Applications**

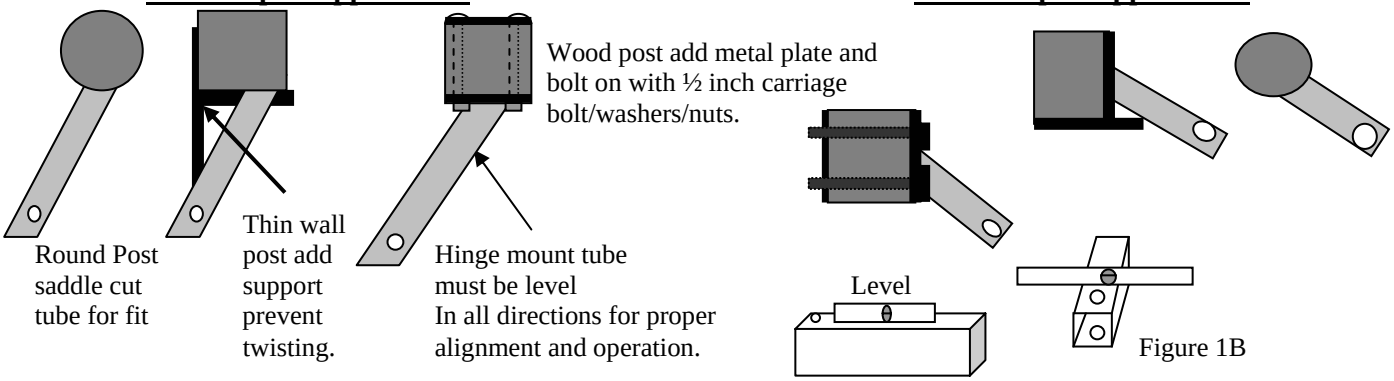


Figure 1B

STEP 1 Hinge Mount Tube Installation (Part 2)

PUSH TO OPEN / TOP VIEW (SEE TOP OF PAGE FOR PULL TO OPEN)

(Left-handed installation shown. Reverse for right-handed installation)

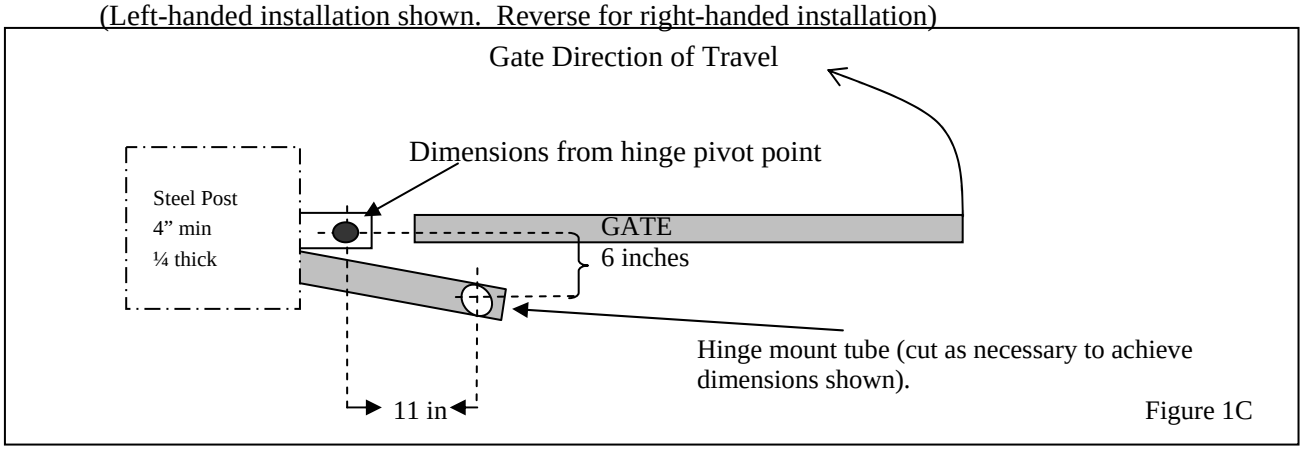


Figure 1C

Regardless of method used, the hinge mount tube should be very secure since the entire force of the gate is directed to this mount. The post must be of adequate strength to resist twisting as well.

Conform to dimensions shown at top of page always. See page 7 to locate height of hinge mount tube on post.

Note: *USAutomatic is not responsible for failure to comply with UL325 standards, local building codes or improper installations.*

STEP 1 Hinge Mount Tube Installation (Part 3)

VERTICAL HEIGHT POSITIONING

Refer to figures 2B-2F to determine the best location for the actuator on the gate. Then use figure 2A to determine the height of the hinge mount tube and gate bracket. The middle of the gate is the ideal location for the actuator. The top or bottom of the gate frame are also possible locations.

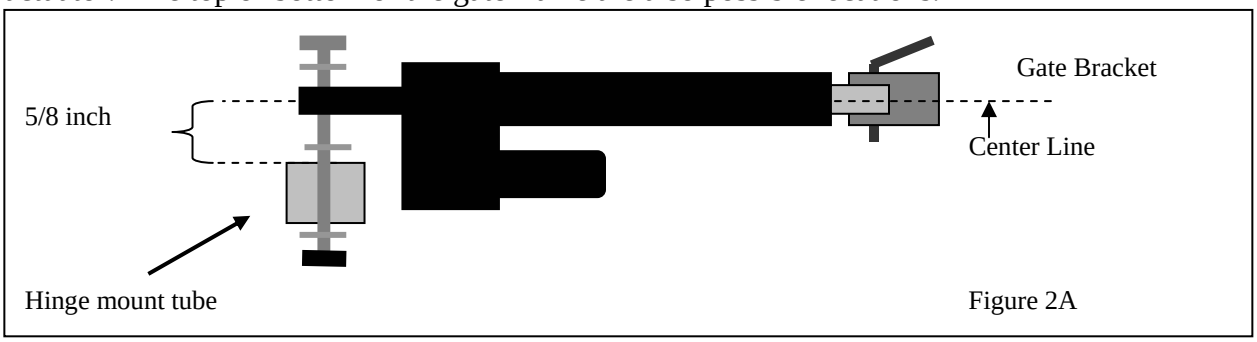


Figure 2A

Correct Installation

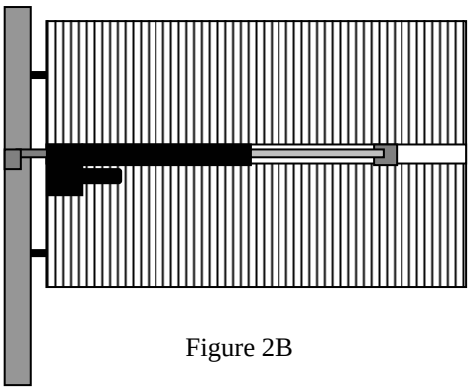


Figure 2B

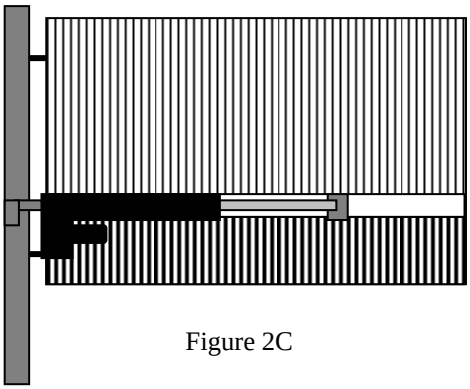


Figure 2C

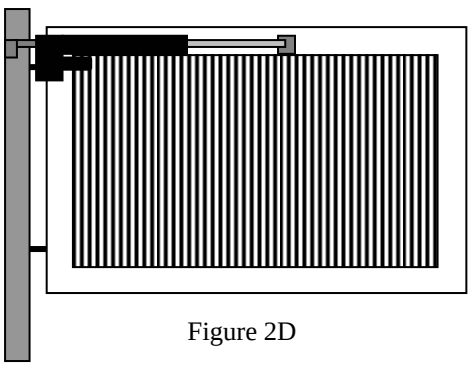


Figure 2D

Incorrect Installation

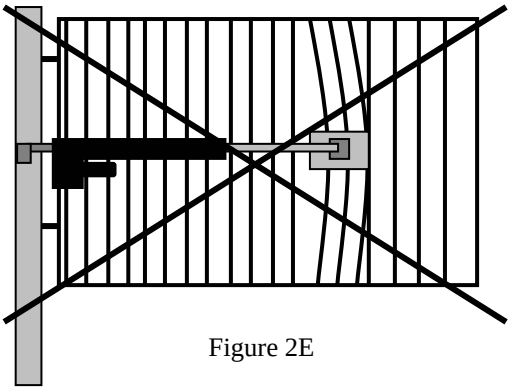


Figure 2E

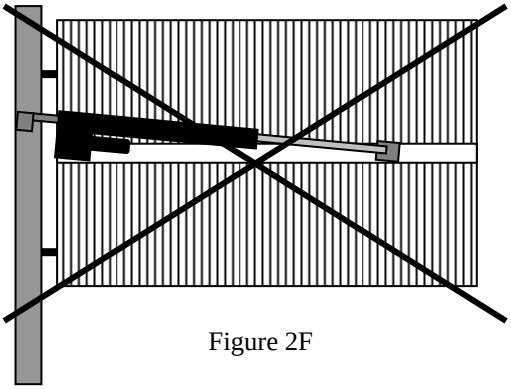


Figure 2F

IMPORTANT:

The gate bracket must be welded in an area that can withstand the full force of the gate. Do not simply weld across a few pickets or bending of the pickets will occur. Add a cross bar if necessary or weld the bracket to the gate frame.

STEP 1 Prepare Actuator for Installation

Assemble the actuator to the gate bracket as shown in figure 3A

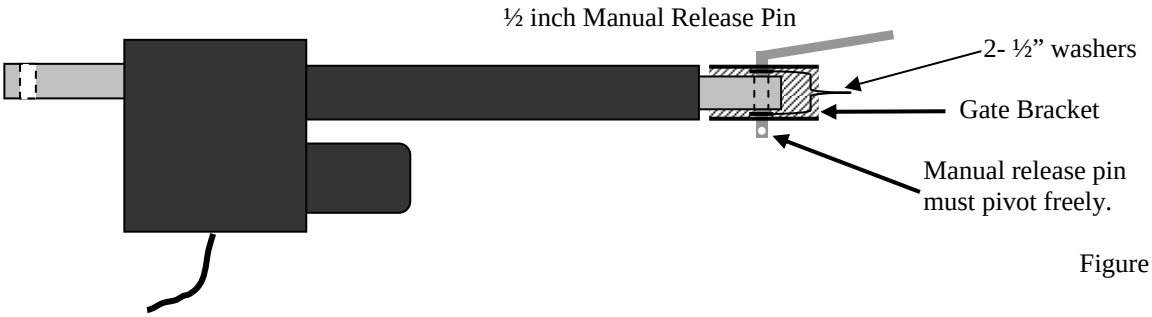


Figure 3A

STEP 2 Actuator Installation

NOTE: *To simplify Limit switch adjustment during installation, the actuator may temporarily be mounted upside down.*

The actuator is adjusted to the fully retracted or open position from the factory. Once the actuator is connected to the hinge mount tube, swing the gate to the desired fully open position and determine location of the gate bracket.

Mount the actuator to the hinge mount tube as shown in Figure 4A.
Support the free end of the unit while mounting.

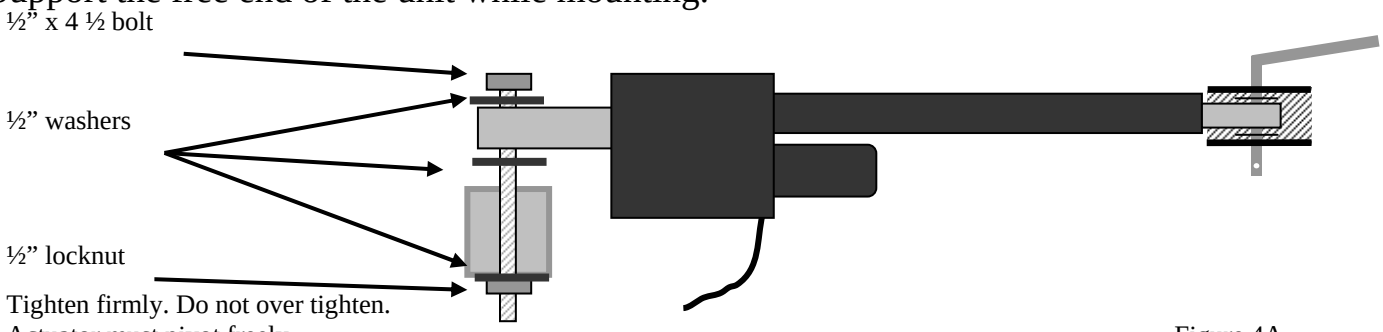


Figure 4A

Do not permanently mount the actuator upside down. Mount only as shown in the illustrations.

Open the gate to the desired OPEN position and block in place to secure the gate and determine gate bracket weld point.

NOTE: *The total opening cannot exceed 110 degrees. Consult a service technician or the factory if greater opening is required.*

STEP 3 Mounting of Gate Bracket (PULL to Open Only)

Clamp the gate bracket to the gate at the previously determined point and weld to gate. Be sure that your gate does not move while clamping. The location of the gate will set your open position. The actuator cylinder will be level if all steps were performed accurately.

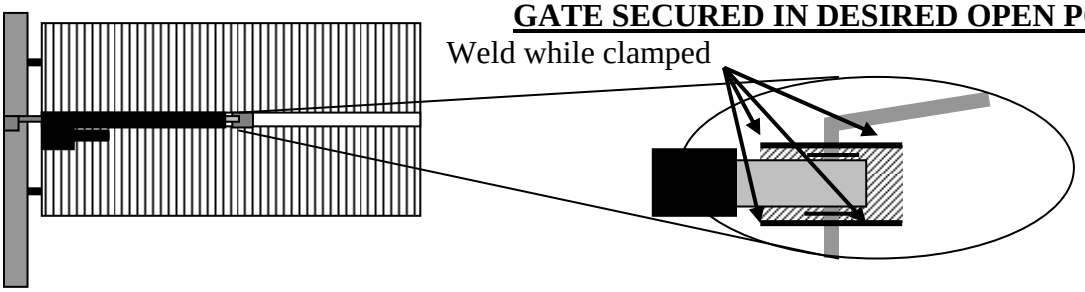


Figure 5A

STEP 4 Mounting of Gate Bracket (PUSH to Open Only)

Close the gate to the desired CLOSED position and block in place to secure the gate and determine gate bracket weld point. Clamp the gate bracket to the previously determined point and weld to gate. Be sure that your gate does not move while clamping. The location of the gate will set your closed position. The cylinder will be level if all steps were performed accurately.

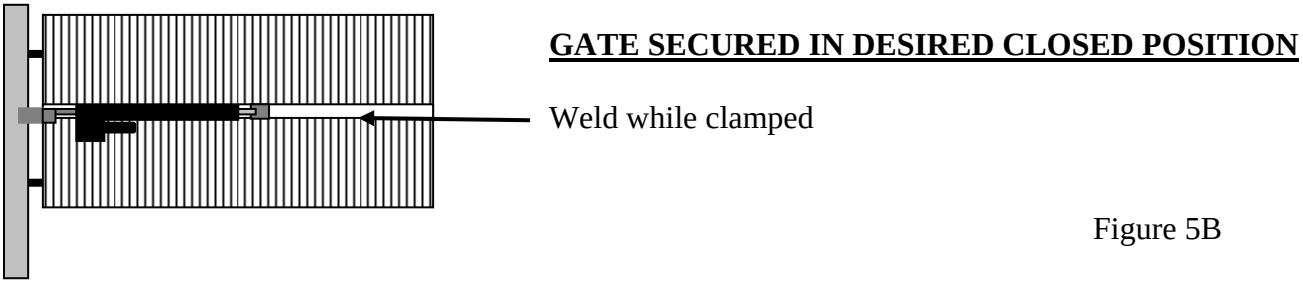
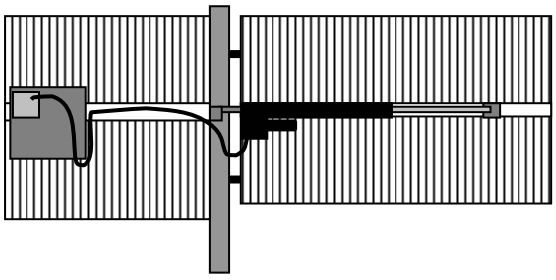


Figure 5B

STEP 5 Mounting Control Box/Actuator Cable Splicing

NOTE: *Push to open installations. See page 10* for more details.

Correct – Install control box to fence by welding or screws. Keep in mind that the actuator cable is 8' in length (avoid splicing cable if possible) if splicing is necessary water tight splices are a must. If drilling is required remove control board and all electronic devices to avoid damage from shavings.



Incorrect – Do not mount in areas by automatic sprinklers or flood prone areas. It is important that all electronics in the control box remain dry.

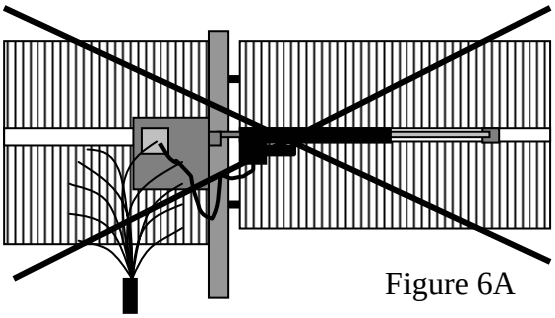
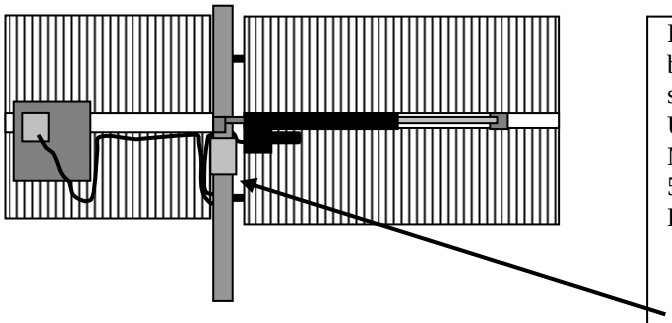


Figure 6A

After securely mounting control box install battery and all electronic components. Route actuator cable through the bottom of control box; do not connect to battery or control board at this time.

Splicing For Actuator Cable

PATRIOT I Single Gate Wiring (only if required)

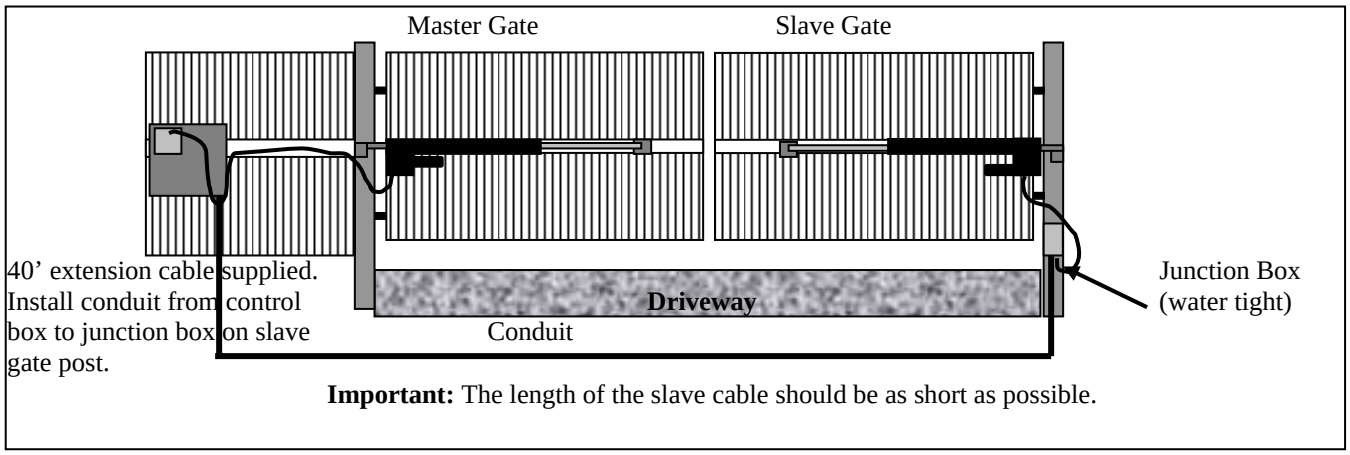


If 8' actuator cable must be spliced a watertight junction box must be used to prevent moisture from splice. The wire used for the splice should be no smaller than the actuator cable wire provided. Use only approved wire nuts or crimp splices for connection. Make second splice inside control box.
5-conductor cable (2-12gauge, 3-18 gauge wires).
Extension cable is sold separately.

Junction Box (Water tight)

Figure 7A

PATRIOT II Dual Gate Wiring (Splice Required for Slave Actuator)


Master Gate
Slave Gate
40' extension cable supplied. Install conduit from control box to junction box on slave gate post.
Driveway
Conduit
Junction Box (water tight)

Important: The length of the slave cable should be as short as possible.

The extension cable supplied with the operator contains the same color wires as the actuator cable splice by matching the colors.

NOTE: *Failure to install extension cable into watertight conduit and keep all connections dry will result in future problems.*

Push to Open Cable Applications

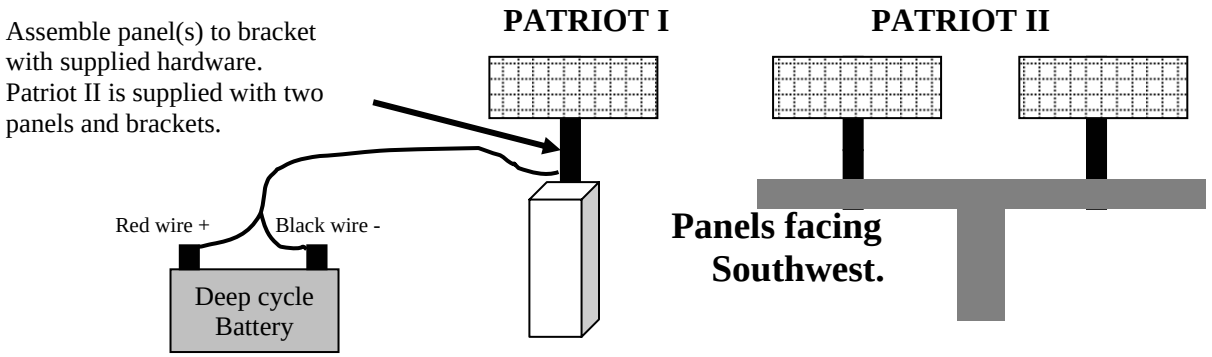
Cable modifications are not necessary for push to open installations. The microprocessor on the circuit board will take care of all wire reversing and logic associated with this type of installation.
DS1 switch number 9 (see page 15) must be in the "ON" position.

NOTE: *The only thing to remember is that when DS1 switch 9 is on the Limit lights on the circuit board will show open when closed and closed when open.*

STEP 6 Installation of Charging Source

SOLAR PANEL

Locate and mount the solar panel bracket so that the panel faces southwest and maintains the preformed 45-degree angle. The standard cable is 10' in length and must feed in through the bottom of the control box. Pay attention to the distance when determining you're mounting location. Although the cable can be extended with watertight connectors, charging power is diminished. Sometimes it is necessary to locate the panel farther away to achieve optimum sunlight, but consider that optimum sunlight might not mean optimum charging if the distance is to great. Use #16 gauge wire or larger and keep length as short as possible.

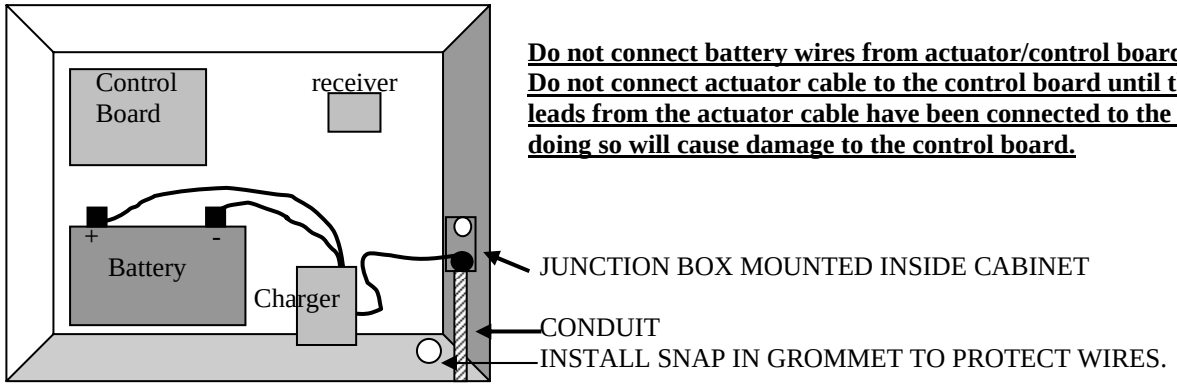

Assemble panel(s) to bracket with supplied hardware. Patriot II is supplied with two panels and brackets.
PATRIOT I
PATRIOT II
Red wire +
Black wire -
Deep cycle Battery
Panels facing Southwest.

Note: *Avoid shaded areas if possible. Panels should face southwest for optimum charging. See explanation above for details.*

AC CHARGER

Locate and install the AC battery charger inside the control box. The charger requires a receptacle for 110-volt AC supply; recommended location is inside the control box. A licensed electrician per local building codes should install the receptacle. **Modifying the charger power cord will void the warranty.**

Note: *USAutomatic recommends an AC surge protector on all 110-volt installations.* Especially *in lightning prone areas. Do not modify the AC cord on the charger.*



Do not connect battery wires from actuator/control board at this time. Do not connect actuator cable to the control board until the battery leads from the actuator cable have been connected to the battery, doing so will cause damage to the control board.

STEP 7 Installing Safety Placards

Mount safety placards on gate. Two signs are provided. Place one sign on each side of the gate where it will be highly visible to anyone on either side of the gate.

STEP 8 Installing Secondary Entrapment Siren

The secondary entrapment siren connects to the control board (see pages 12,31). This siren is very loud and will be activated anytime the current sense circuit stops the gate twice prior to reaching a fully open or close limit. The reset button on the control board (see page 12) must be pushed to turn off the siren, and reset the control board.

STEP 9 Making Final Adjustments

In order to make final adjustments, a signal device such as a radio control should be used. The control board is equipped with an "Open / Close Command" pushbutton for this purpose. The gate will open if closed or close if in the open position. A signal in mid-travel will stop the gate.

- If your unit was purchased with a radio receiver, it is important that you change the default code settings. Please consult a dealer for assistance. RCS transmitter / receiver instructions are on page 29.

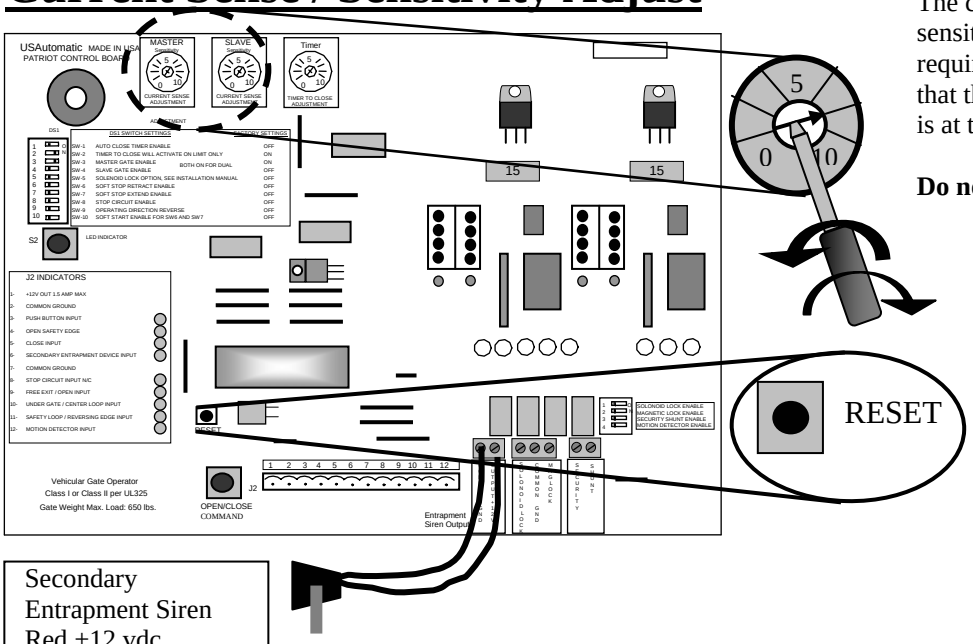
IMPORTANT NOTES

1. Locate the actuator cable plug and be aware that you may need to disconnect it if the cylinder over travels the desired stop points. You should be able to stop the motor with the open/close command button or the reset button on the control board or a signal from your device without having to disconnect the plug, but in cases of incorrect wiring, the plug can be used as an emergency power shut-off.
2. Locate the sensitivity adjustments. Notice that there are two adjustments MASTER and SLAVE we intentionally set the sensors at a highly sensitive setting. This may need to be adjusted to achieve gate movement without tripping the sensitivity circuit and causing the gate to reverse direction. If the gate reverses direction twice and then stops the control board will need to be reset. See Current Sense Adjustment and reset button location below.
3. Study the limit switch section and instructions on adjusting the limit switches prior to battery hook up. See page 13 for details.

If you have an understanding of the sensitivity feature, how to disconnect the actuator plug in an emergency, and how to adjust the limit switches, then proceed to hook up the battery leads and connect the actuator plug to the control board. The red battery lead goes to the positive + terminal on the battery and the black lead goes to the negative - terminal on the battery.

Caution: Connect battery leads to battery before connecting actuator plug to the control board.

Current Sense / Sensitivity Adjust



Secondary Entrapment Siren
Red +12 vdc
Black Ground

The control board has two adjustments for sensitivity MASTER and SLAVE. Dual gates will require adjustment of both, adjust sensitivity so that the gate force required to sense an obstruction is at the desired level.

Do not turn the adjustment screw past 0 or 10.

If the sensing circuit is activated twice before reaching an open or closed limit the unit will stop operating and sound the secondary entrapment siren and require a reset.

Remember if the gate reverses direction when operating without contacting an obstruction, then minimizing sensitivity (increase force) may be required.
Do not increase more than necessary.

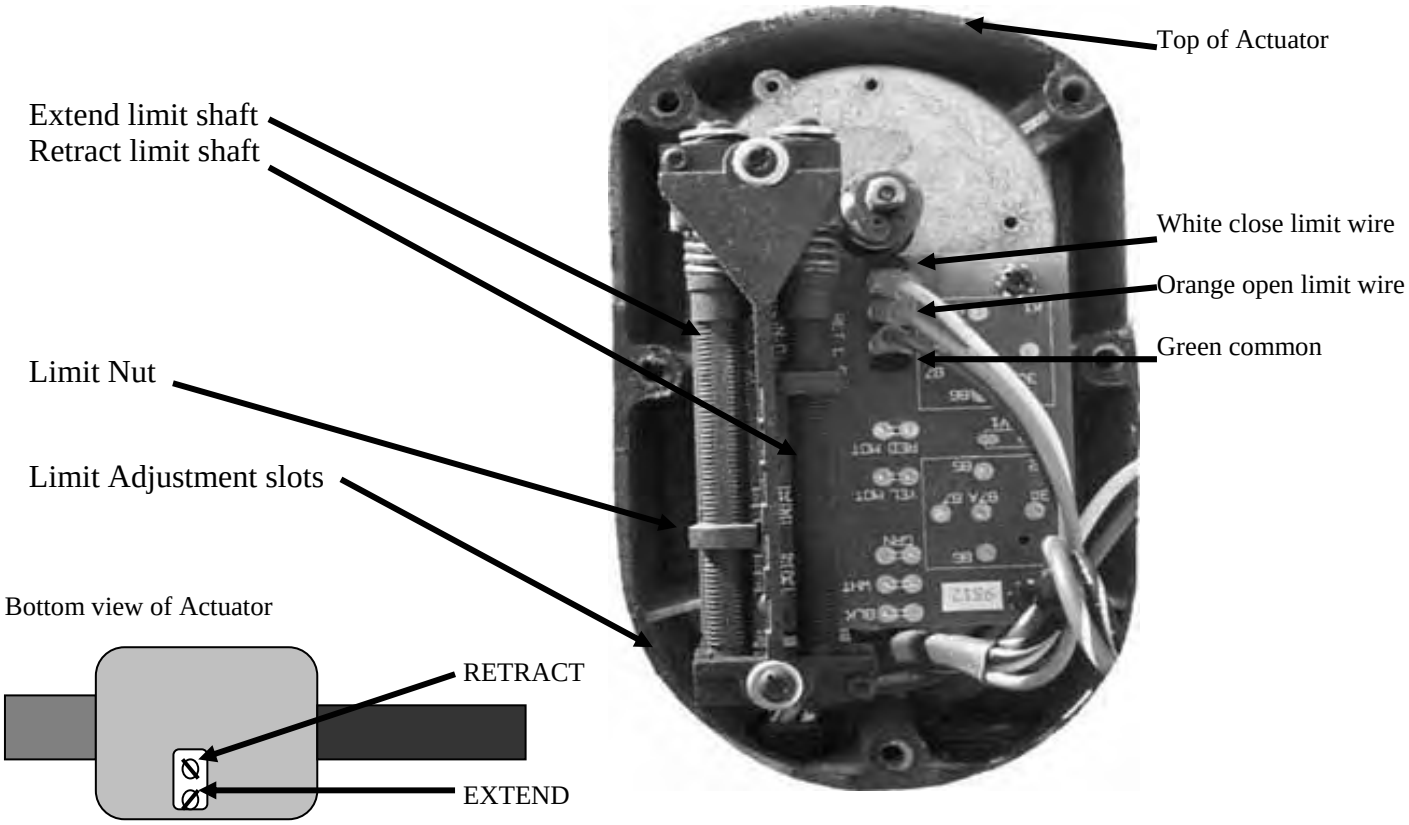
CAUTION: To reduce the risk of injury, USAutomatic strongly recommends the installation of additional safety devices such as Photo Eye Sensors and Safety Edges. Consult an authorized installing dealer or the factory for a complete explanation of options and see the Safety Section of this manual on pages 17 to 20.

LIMIT SWITCHES

The limit switch adjustments are located on the bottom of the actuator. Remove the dust plug to make adjustments. The normal settings from the factory allow for 18" of travel (approx. 70% opening). You will most likely have to adjust the extend or close limit for your installation. The adjustments are labeled "Extend" and "Retract" on the dust plug. Flat blade screwdriver is included with the operator.

If soft stop is going to be used turn switch 6 or 7 (see page 15) on at this time. Prior to operation the extension tube needs to be turned about 5 or 6 turns in the counter clockwise direction. Disconnect from gate bracket to turn.

NOTE: *ALL ADJUSTMENTS SHOULD BE MADE IN THE MID TRAVEL (1/2 OPEN) POSITION. DO NOT FORCE THE ADJUSTMENT; FORCING WILL DAMAGE THE LIMIT ASSEMBLY. REMOVE THE ADJUSTMENT TOOL AFTER EACH ADJUSTMENT.*

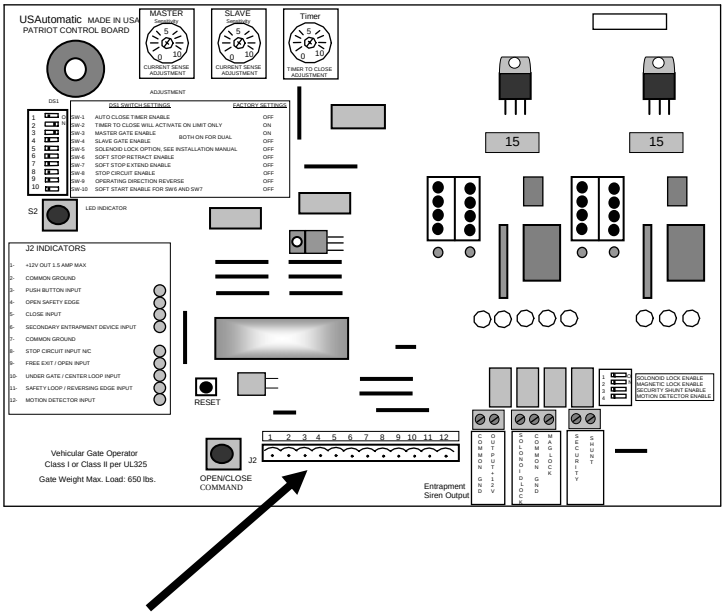


The following will assist you. Shown below are adjustments for pull to open installations. You can mount the actuator upside down to make adjustments easier, but do not leave actuator upside down.

To extend more or close gate more.	Turn the extend adjust clockwise.
To extend less or close gate less.	Turn the extend adjust counter clockwise.
To retract more or open gate more.	Turn the retract adjust clockwise.
To retract less or open gate less.	Turn the retract adjust counter clockwise.

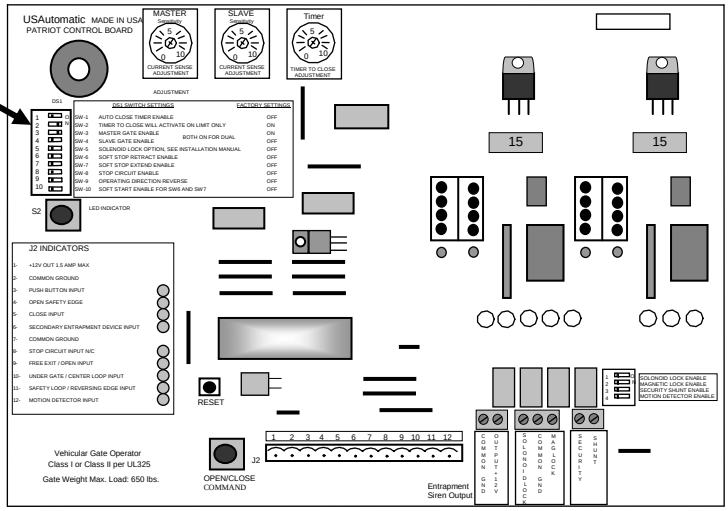
Circuit Board Terminal Description For Accessories

Patriot Control Board



TERMINAL	DESCRIPTION
1	**+ 12 volt dc Output**. *Maximum current output 1.5 amp (1500 milliamps)
2	**Common Ground Input**
3	**Push Button Input**. (normally open contacts) Push button, radio control, keypad, etc.
4	**Open Safety Edge** (normally open contacts) (Stops gate when opening)
5	**Close Input** (normally open contacts)
6	**Secondary Entrapment Input** (normally open contacts)
7	**Common Ground Input**
8	**Stop Circuit Input** (normally closed contacts) * DS1 switch #8 must be on for stop circuit function to be enabled.
9	**Free Exit/Open Input** (normally open contacts) Loop input or any hold open input such as a 7-day timer, telephone access unit, or maintain contact switch (normally open contacts). These devices open the gate and will prevent the gate from closing if the contact is maintained. Once the contacts have been released, the gate can be closed with a closing signal device or the automatic close timer feature. Receiver relay 2 pre-wired for latching open.
10	**Center Loop or Under Gate Loop Input** (normally open contacts)
11	**Safety Loop/Reversing Edge Input** (normally open contacts)
12	**Motion Detector Input** (normally open contacts) (Stops a closed gate from opening)(Active on close limit only)

DS1 Programming Switches



Factory settings are shown in bold italic type

1 Automatic Close Timer Enable (Not recommended unless safety devices are installed)
ON Timer to close is activated
OFF ***Timer to close is disabled***

2 Open limit timer to close function
ON ***Timer to close activates only if open limit is activated***
OFF Timer to close works from any point the gate is stopped

3 Master Gate Enable
ON ***Master gate operator enabled to function***
OFF Master gate operator disabled

4 Slave Gate Enabled (Both Master and Slave on for dual)
ON Slave gate operator enabled to function
OFF ***Slave gate operator disabled***

5 Solenoid Lock Option, See Installation Manual
ON DS2 SW 1 must be on, output +12vdc with delay when gate is operating
OFF ***No function, see DS 2 SW 1 for more information***

6 Soft Stop Retract Enable
ON Enables soft stop for retract position
OFF ***Disables soft stop for retract position***

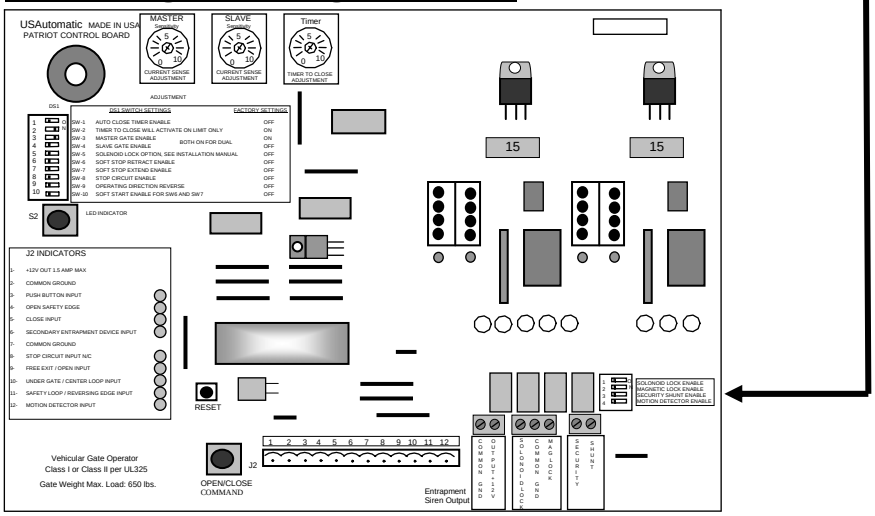
7 Soft Stop Extend Enable
ON Enables soft stop for extend position
OFF ***Disables soft stop for extend position***

8 Stop circuit enable * A normally closed pushbutton is required
ON Allows for a stop button input to be utilized
OFF ***Disables the stop button function***

9 Operating Direction Reverse
ON Push to Open
OFF ***Pull to Open***

10 Not used at this time
ON
OFF

DS2 Programming Switches



Factory settings are shown in bold italic type

1 Solenoid lock enable / Gate in operation indicator

ON Solenoid lock output energizes half second before gate begins to move and releases 3 seconds after gate begins to move, for gate in operation indicator to operate DS1 SW 5 must also be ON.
(Energizes = +12 vdc output 1.5 amp max)

OFF ***Solenoid lock / gate in operation indicator is inactive***

2 Magnetic lock enable

ON Magnetic lock output energizes on Master Limit and releases half second before gate begins to open
(Energizes = +12 vdc output 1.5 amp max)

OFF ***Magnetic lock output is inactive***

3 Security Shunt Circuit Enable / Open Gate Indicator

ON Security shunt circuit relay is active (closed circuit)(wire in parallel)
Relay activates half second before gate begins to Open and stays activated until 4 seconds after gate reaches a closed limit.

OFF ***Security shunt circuit relay is inactive (open circuit)***

4 Motion Detector Enable

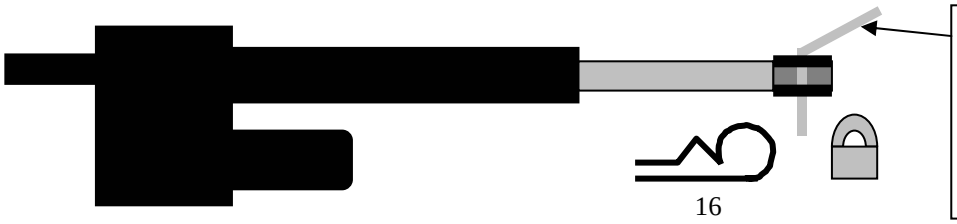
ON Enables motion detector input J2 pin 12 (if input is activated, gate will not open)

OFF ***Disables motion detector input J2 pin 12***

Emergency Manual Release

Remove the manual release pin at the gate bracket and open the gate by hand. Secure the gate before attempting to pass through.

NOTE: Before detaching actuator arm from gate turn DS1 dipswitch 3 and 4 to the "OFF" position. (page 15). This will keep the actuator from operating while disconnected from the gate.



Manual Release Pin

Secure in place with pull clip or with #2 lock. Release pin is predrilled for this purpose.

SAFETY SECTION

USAutomatic gate operators are certified to UL325 Vehicular Class I and Class II swing gate standards.

UL325 identifies four different classes of gate operators these classes are listed below:

Class I: Residential vehicular gate operator- a vehicular gate operator (or system) intended for use in a home of one to four single family dwellings or a garage or parking area associated therewith.

Class II: Commercial/General access vehicular gate operator- a vehicular gate operator (or system) intended for use in a commercial location or building such as multi-family housing unit (five or more single family units), hotel garages, retail store, or other buildings servicing the general public.

Class III: Industrial/Limited access vehicular gate operator- a vehicular gate operator (or system) intended for use in an industrial location or building such as a factory or loading dock area or other locations not intended to serve the general public.

Class IV: Restricted Access vehicular gate operator- a vehicular gate operator (or system) intended for use in a guarded industrial location or building such as an airport security area or other restricted access locations not servicing the general public, in which unauthorized access is prevented via supervision by security personnel.

Patriot I and Patriot II gate operators are intended to be installed as Class I or Class II vehicular gate operators, and the maximum load of each gate leaf should not exceed 650 pounds with a length not to exceed sixteen feet.

SAFETY SECTION

INSTALLATION

Install the gate operator when:

- The operator is appropriate for the construction of the gate and the usage class is correct for the installation.
- All exposed pinch points are eliminated or guarded.
- Only install on vehicle gates, pedestrians must be supplied with a separate access opening.
- The gate is installed in a location where enough space is supplied between adjacent structures and the gate that when opening or closing the chance of entrapment is reduced.
- Swing gates shall not open into public access areas.
- The gate is properly installed and swings freely in both directions. Do not over adjust the sensitivity adjustment to compensate for an improper gate installation.
- Locate all controls at least six feet away from the gate to eliminate the chance of the person operating the gate from coming in contact with the moving gate. Do not install external buttons, which can be used to operate the gate within the reach of children.
- All placards must be installed one on each side of the gate visible in the gate area.
- Contact sensors used for secondary entrapment safety devices and their wiring must be installed in a manner protects them from mechanical damage.
- Non-Contact sensors used for secondary entrapment safety devices must be located so that the signal from the transmitter to the receiver is not interfered with by adjacent structures. All exposed wiring must also be protected from mechanical damage.

SECONDARY ENTRAPMENT DEVICES

USAutomatic has designed all control boards with secondary entrapment device inputs and secondary safety devices must be installed with all installations. USAutomatic recommends the use of UL325 listed safety devices.

NOTE: *USAutomatic recommends that these devices be CONNECTED after proper gate installation and operation has been verified. Then connect one device and verify proper operation before installing the next device. Ensure that power is disconnected from the control board prior to connecting any wires to the control board.*

WARNING: TO REDUCE THE RISK OF INJURY OR DEATH

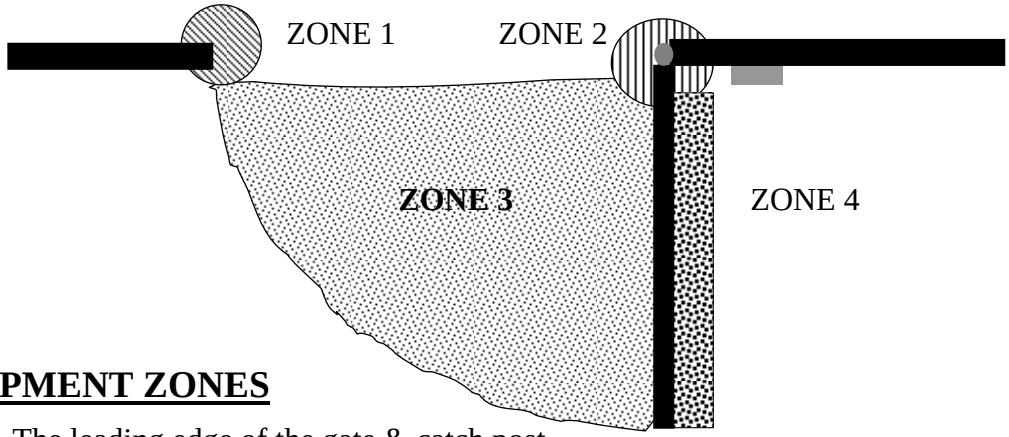
1. **READ AND FOLLOW ALL INSTRUCTIONS**
2. **Never let children operate or play with gate controls. Keep remote control away from children.**
3. **Always keep people and objects away from the gate.**
4. **NO ONE SHOULD CROSS THE PATH OF A MOVING GATE.**
5. **Test gate operator monthly. The gate must stop and reverse directions upon contacting a rigid object or when the secondary entrapment device is activated.**
6. **After all adjustments have been made to the limit switches, sensitivity (current sense) circuit, secondary entrapment devices and all other external devices installed the safety devices must be checked again. Failure to adjust and retest the gate operator can increase the risk of injury or death.**
7. **Verify that the emergency release (manual release) pin can be easily removed. This should only be checked when power is disconnected from the operator.**
8. **KEEP GATES PROPERLY MAINTAINED. Read the user manual and have a qualified service technician make repairs to the gate hardware.**
9. **THE ENTRANCE IS TO BE USED BY VEHICLES ONLY. Pedestrians must use a separate entrance.**
10. **SAVE THESE INSTRUCTIONS**

SAFETY SECTION

All safety features required by UL 325 are incorporated in the capabilities of all USAutomatic Control boards and should be utilized, including but not limited to, safety edges, photo electric eyes, reverse sensing, and motion sensing.

Cautions - Very Important

- Do not attempt to enter the gate area while the gate is moving. Wait until the gate comes to a complete stop.
- Operate the gate only when it is fully visible, free of persons or obstructions, and properly adjusted.
- Do not allow children to play in the area of the gate. Do not allow anyone to ride on the gate.
- Do not allow children to play with the remote control or any other activation device. Do not attempt to "beat the gate" while the gate is opening or closing. This is extremely dangerous.
- Test the current sense feature and all safety devices regularly to insure correct operation.
- Study this entire Safety Section paying particularly close attention to the entrapment zones shown below and be aware of these areas not only during use but also during any adjustments to the unit.



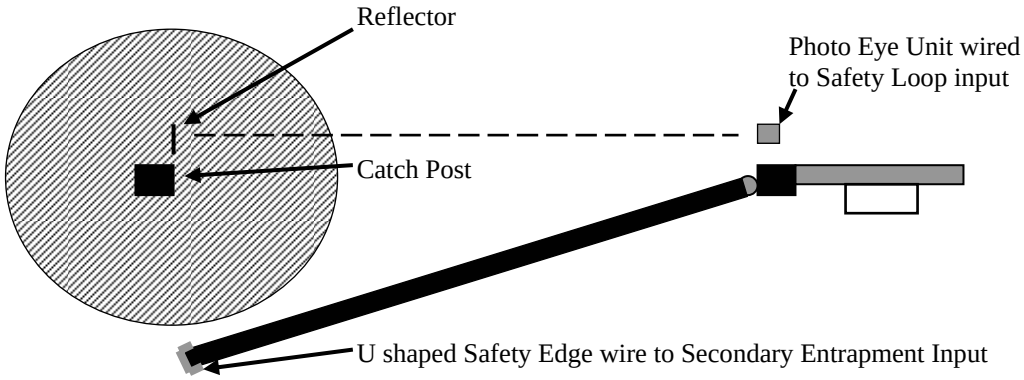
ENTRAPMENT ZONES

Zone 1 The leading edge of the gate & catch post.
Zone 2 Between the gate and hinge post.
Zone 3 The arc of the gate or gate path.
Zone 4 The space between the gate when open and any obstruction such as fence, wall, landscaping, etc
Zone 5 (Not shown above see page 20) the point where two bi-parting gates come together when closing. This is similar to Zone 1.

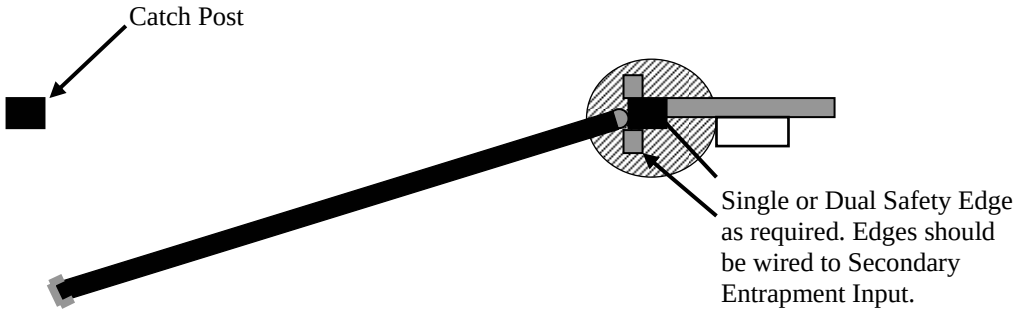
SAFETY SECTION

Remedies for Safety Concerns

Zone 1 Safety edges and photo electric eyes are the most common types of protection available.



Zone 2 A safety edge may also be utilized here but the best remedy is to eliminate pinch points when designing the hinges. Most injuries at this point result from negligence, such as reaching through the hinge area or the gate to activate a button, key switch, etc.



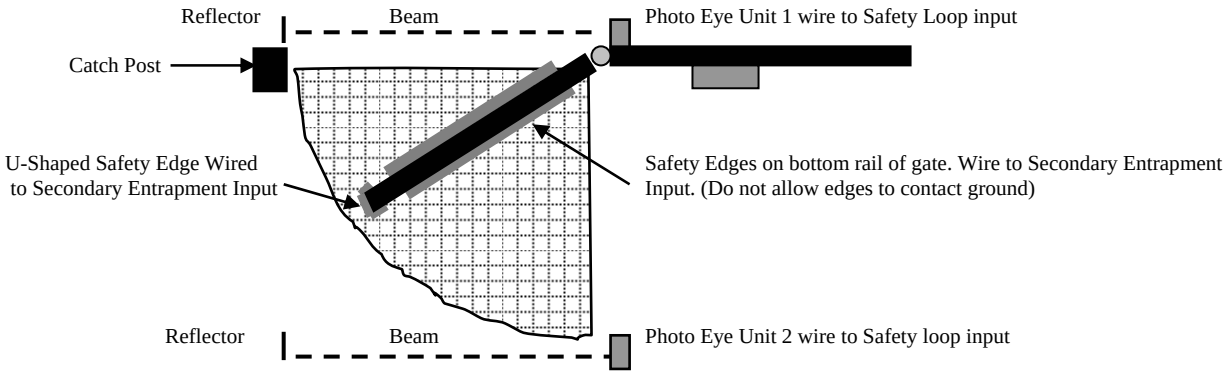
NOTE: *All control stations should be located at least 6 feet from any moving part of the gate or operator.*

Never install any control device where a user will be tempted to reach through the gate or fence to activate a gate.

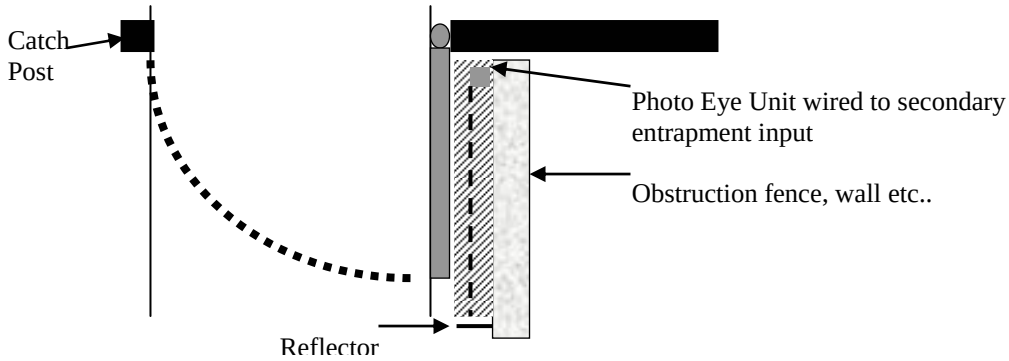
SAFETY SECTION

Remedies for Safety Concerns

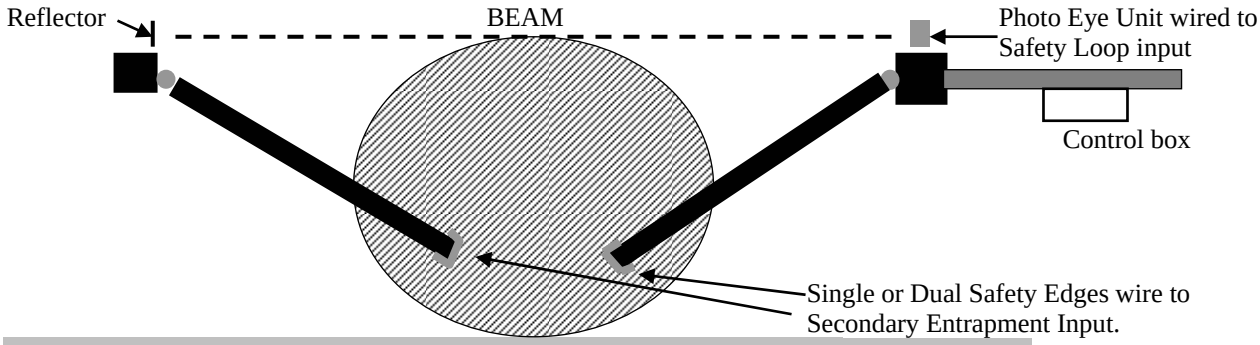
Zone 3 Safety edges are the best protection. A photo eye may also be used. For vehicle traffic, magnetic vehicle detectors and wire sensing loops are preferred.


Reflector
Beam
Photo Eye Unit 1 wire to Safety Loop input
Catch Post
U-Shaped Safety Edge Wired to Secondary Entrapment Input
Safety Edges on bottom rail of gate. Wire to Secondary Entrapment Input. (Do not allow edges to contact ground)
Reflector
Beam
Photo Eye Unit 2 wire to Safety loop input

Zone 4 This area is best protected with a photo eye wired to the secondary entrapment input. The beam should be installed parallel to the gate in the open position or along the obstructing wall or fence.



Zone 5 Safety edges and photo eyes are the most common types of protection available.


Reflector
BEAM
Photo Eye Unit wired to Safety Loop input
Control box
Single or Dual Safety Edges wire to Secondary Entrapment Input.

NOTE: *When gates are fully closed Safety Edges must not contact each other. This can cause false obstruction sensing*

Every installation is unique and it is the installer's responsibility to recognize and remedy all safety concerns. Please consult a qualified dealer or the factory for a complete explanation of the remedies shown above and additional tips pertaining to your installation.

Periodic Service

All gate operators require periodic checking and adjustments by a qualified technician of the control mechanism for force (load), speed and sensitivity. All external accessories and secondary safety devices must be checked. Secondary safety devices need to be checked at least once a month for proper operation.

Periodic checking is also advised for the following:

1. **Battery cells water level. (Use distilled water if needed)(Sealed Gel batteries preferred)**
2. **Hinges and pivot points need to be greased. Apply grease to actuator stainless tube as needed.**
3. **Bolts for correct tightness.**
4. **Inspect weld points for cracks or other defects.**
5. **Inspect wiring for cuts, nicks or other defects.**
6. **Inspect hinge post to ensure it is not moving or twisting.**
7. **If AC charger is used verify proper charger operation, refer to charger instructions.**
8. **Verify that the inside of the control cabinet remains clean and free of insects. Do not spray control board with bug spray.**

Troubleshooting Guide

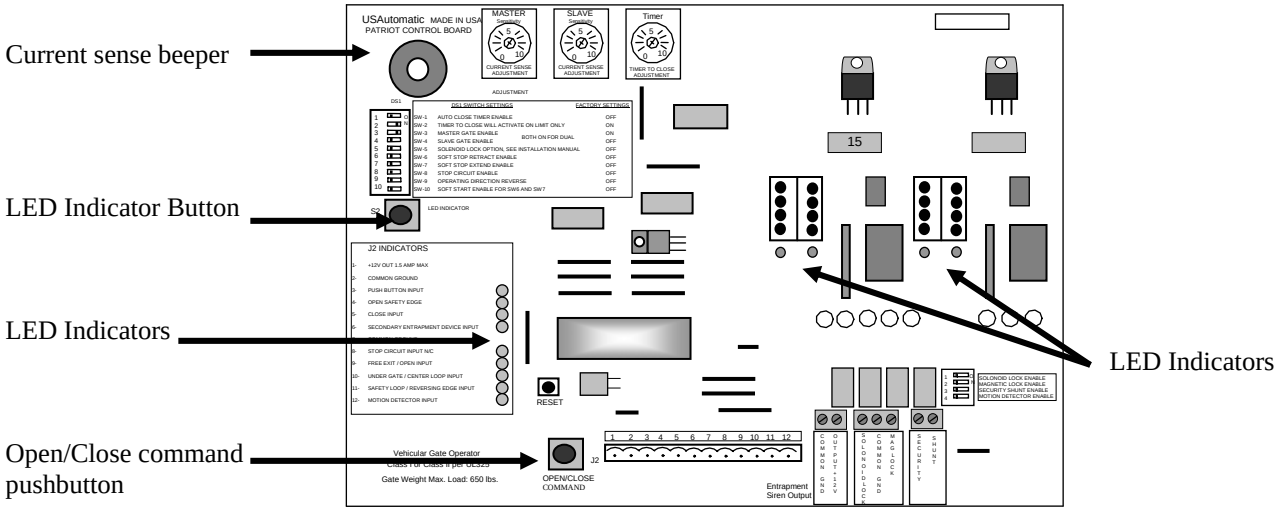
Introduction

The Patriot control board is equipped with three unique features to assist in troubleshooting a gate system.

1. The first and most helpful is the series of LED indicating lights. These lights will help to identify problems with the actuator limit switches and all control circuits. To use the indicators, press and hold the "LED indicator" button on the control board. (The LEDS are not active at all times to save battery life). Any circuits or limit switches that are activated will be obvious by the illumination of the adjacent LED.

2. The second feature to assist in troubleshooting is the current sense beeper. The beeper will sound anytime the current sense circuit is activated. This is useful in detecting a false reverse due to an improper or too sensitive current reverse setting or a gate, which is requiring excessive force to move the gate.

3. The third feature to assist in troubleshooting is the on board open/close command pushbutton. This button makes it possible to operate the gate with the twelve terminal wiring plug removed without having to short across terminal pins.



TROUBLESHOOTING SECTION

OUTLINE

1 Single gate will not operate.

2 Dual gate will not operate.

3 Single or Dual gate opens or closes very slow.

4 Gate will not automatically close.

5 Gate begins to open or close, but stops and reverses after a couple of seconds.

6 Single Gate opens correctly then closes immediately or single Gate closes correctly and then opens immediately.

7 Dual Gate opens correctly then closes immediately or dual Gate closes correctly then opens immediately.

8 Control board 15 amp fuse blows when open/close command is given.

9 Transmitter (Remote control) will not operate the gate.

10 Photo eye, safety loop or other safety accessory will not reverse the gate when closing.

11 Pressing the "RESET" button only, causes the gate to operate.

Terms and Definitions

LED - Light emitting diode, small red lights on control board.

Control board- Located inside the metal box just above the battery.

Receiver - Located inside the metal box in the upper right corner, coax cable connected to it.

Transmitter - Hand held push button, which is used to operate the gate, sends signal to receiver.

Actuator - Connected to gate and hinge post, contains the motor, gearbox and extension tube.

Connector - Control board has two types. Two white 8-pin connectors (X1 and X2) are used to connect actuator to control board and one green 12-pin connector (J2) (located bottom center of control board) to connect receiver and accessories to control board. Both are plug type and can be disconnected (unplugged from control board) without disconnecting wires.

Dip Switches - Small switches, which are located on the control board in two places. The primary set DS1 is located in the upper left corner and the secondary set DS2 are located in the lower right corner of the control board with functions listed beside each. See manual (page 15, 16) for more information.

Push Buttons - Three are located on the control board. "Open/Close command" used to operate the gate, "Led Indicator" used to activate the leds and the "Reset" used to reset the control board after current sensing twice before a limit is reached.

1. My single gate will not operate Patriot I:

STEP 1 Remove control box cover locate the "Open/Close Command" push button and press it to operate the gate.

STEP 2 Press the "Reset" push button located above the open close command, then push the "open/close command" push button to operate the gate.

STEP 3 When pressing the "open/close command" push button, listen for a clicking sound, if click is heard then verify: The 15-amp fuse located on the control board is good if not replace it using the spare located on the control board. Also check the dipswitches (3 and 4) for correct switch settings based on where the actuator is connected to the control board (Master or Slave). If switches and fuse are good and clicking sound is heard the battery needs to be load tested to determine its condition. Charge or replace depending on results.

STEP 4 Press and hold the "LED Indicator" push button and observe all of the red LED's (see page 18 for location):

a. If the two limit LED's located below the actuator plug are both on the operator will not operate, you must adjust the limit switch (see page 10) Example- if both limit LED's are on when the gate is in the closed position (and actuator is connected to the gate) the problem is with the open limit switch, adjust the open limit until the LED goes off and adjust the gate to the desired stopping position. Both LED's should never be on simultaneously.

b. If any of the LED's in the lower left corner of the control board are on then this must be corrected. Locate the accessory, which is activated, and repair or replace. Disconnecting this device will allow the operator to work, without the disconnected accessory function.

STEP 5 Disconnect the green J2 connector. Once disconnected, press the "open/close command" button. If gate operates go to step 4 b above.

STEP 6 Verify that DS1 switch 8 is off.

STEP 7 Call the factory for more information if the above steps have not worked.

2. My dual gate will not operate Patriot II:

STEP 1 Follow steps 1 through 6 above.

STEP 2 Disconnect the actuator connectors plugged into the control board (X1 and X2). Then locate the DS1 dipswitches on the control board. Turn off switch 4 (slide to the left) and turn on switch 3 (slide to right).

Reconnect the connector from the actuator that goes to the gate closest to you; connect it to the Master (X1) connector on the control board. Press the "open/close command" button and verify that the gate operates.

STEP 3 If the gate operates correctly, disconnect the actuator plug and connect the other actuator plug into the X1 connector, and press the "open/close command" button and verify that the gate operates correctly. At this point you have tested each actuator individually. If both worked correctly then go back to DS1 and turn switch 3 off and switch 4 on. Then repeat step 2 and 3 again using X2 connector on control board in place of X1.

STEP 4 If a problem is observed in steps 2 or 3 above most likely it was when the slave actuator (located the greatest distance from control box) was being tested, if this is correct check wiring splices for moisture, correct wiring and etc. If the wiring is not in watertight conduit and this is most likely the problem. Tape is not watertight.

3. My gate opens/closes very slow:

NOTE: When the gate is running slow the reason is low battery voltage, two things need to be considered. Battery condition (replace or charge) and what caused the battery to become discharged.

STEP 1 Determine which situation your operator falls into below:

Solar charged, ensure that you have a deep cycle battery installed and if accessories are connected (keypads, loop detectors, any device powered by the battery) verify that the current draw needed to power them does not exceed the charging power of the solar panel. Verify that solar panel leads are connected to the battery correctly; panel is facing a southwest direction and is not located in a completely shaded area. Inspect panel surface and wires for damage.

Test solar panel for correct voltage and current output, disconnect panel wires from battery and using a DC voltmeter measure the dc voltage (should measure about 22 volts) and the dc current (should read about 250 ma) in the peak sun period. If either, of these readings is incorrect panel maybe defective.
If none of the above check bad then remove battery and have it load tested at a battery shop. Replace if bad.

AC charged, ensure that you have a deep cycle battery rated at a minimum of 60 amp-hour installed. If accessories are connected (keypads, loop detectors, any device powered by the battery) verify that the current draw needed to power them does not exceed the charging power of the charger. Verify that charger leads are connected to the battery correctly; charger is connected to an approved 110 VAC receptacle. Inspect charger and wires for damage.

NOTE: The USAutomatic multi stage charger does not output any voltage or current when disconnected from the battery, you cannot check charger by disconnecting from battery and measuring voltage output. To check charger output disconnect from battery, measure battery voltage and note. Reconnect charger and monitor battery voltage it should rise above the battery voltage noted above.

STEP 2 The charger has LED indicators (lights) on the faceplate, observe the LED's that are on or not and refer to the troubleshooting directions furnished with the charger for definitions of different LED indicators.

STEP 3 If none of the above check bad then remove battery and have it load tested at a battery shop. Replace if bad.

4. My gate will not automatically close:

NOTE: If DS1 switch 1 is on and switch 2 is off then the gate should automatically close from any position, but if switch 2 is also on the gate will only automatically close if the "open limit" LED (both "open limit" LED's for dual gate) is on.

STEP 1 Locate the "Open/Close Command " push button; press the button to verify that the gate will close. If gate closes correctly then proceed to the steps below.

STEP 2 Verify that DS1 switch 1 is on. If not turn it on and recheck gate operation. If gate remains open continue with step 3.

STEP 3 If your installation is a single gate, then only DS1 switch 3 or 4 can be on. If both are on the gate will not automatically close. Turn off the one that is not being used and recheck gate operation.

STEP 4 Locate the "LED Indicator" push button and depress and hold. While pushing the button inspect the LED indicators located just below the X1, X2 (master, slave) actuator plugs, note which LED's are on. Read note below.

NOTE: The two LED's located below the X1, X2 actuator plug when on represent the closure of the limit switch. If the left LED is on then the gate should be in the open position, if the LED on the right is on then the gate should be in the closed position. If DS1 switch 9 (operating direction reverse) is on then this is reversed. If the LED for the open position is not on when the gate is fully opened then the auto close will not work. The limit switches need to be adjusted.

STEP 5 Locate the "LED Indicator" push button and depress and hold. While pushing the button inspect the LED indicators located on the control board (lower left corner) and note which LED's are on. If any LED's are on disconnect the green J2 connector from the control board. Press the "Open/Close Command " push button to close the gate, and then press the button again to open the gate fully and verify the automatic close is working.

STEP 6 If gate automatically closes correctly then the accessory connected to the J2 connector that is activated (LED is on) needs to be repaired.

5. Gate begins to open or close but stops and reverses after a couple of seconds.

STEP 1 Remove control box cover and locate the Patriot control board. Locate the sensitivity adjustment (see page 12) potentiometer located on the control board. The white center is adjustable and needs to be turned in a clockwise direction.

STEP 2 Normally a setting of 5 will operate most gates; if your gate requires a setting above 8 there is a good chance that your gate has a problem, which needs to be corrected. Possible causes are incorrect hinges, gate touching the ground; gate not level or the actuator arm connected to the gate has been bent. Identify and correct problem.

6. Single Gate opens or closes correctly then immediately reverses direction:

STEP 1 This is most likely caused by an incorrect limit switch adjustment. The limit switch adjustments are located on the bottom of the actuator motor housing, behind the removable rubber plug. Locate the limit switch adjustment screws and determine which one needs to be adjusted (see page 12). Operate the gate and once it reaches the desired open or close position stop the gate in that position, using the transmitter or "Open/Close Command" push button located on the Patriot control board.

STEP 2 Locate the "LED Indicator" push button located on the left side of the Patriot control board. Also locate the open and close LED indicators below the actuator plug on the Patriot control board. The left LED represents the open position and the right LED represents the close position. (See note below)

STEP 3 With the gate in the desired open or close position press and hold the "LED Indicator" and observe which of the LED lights come on. If your gate is in the desired open position then the LED on the left should be on, if not adjust the retract limit switch (see page 13) until the LED comes on. If gate was in the close position adjust the extend limit switch until the close LED comes on.

NOTE: If DS1 switch 9 is turned on, then the open and close LED's are reversed. Open LED represents the closed position and the close LED represents the open position.

STEP 4 Once adjusted correctly the open LED should be on when the gate is opened and the close LED should be on when the gate is closed.

STEP 5 If the LED's will not come on then contact the factory.

7. **Dual Gate opens or closes correctly then immediately reverses direction:**

STEP 1 This is most likely caused by an incorrect limit switch adjustment. First determine which gate is in need of adjustment.

STEP 2 Locate the DS1 switches on the Patriot control board. Switch 3 and 4 should be turned on for a dual gate, turn off switch 4 this will disable one gate.

STEP 3 Operate the gate and verify that it stops in the correct position, if so then turn switch 4 back on and turn off switch 3. Operate the other gate now and verify that it stops in the correct position. One or both should not stop in the correct position.

STEP 4 Once the gate that needs adjustment is identified (possibly both) refer to problem 6 above steps 1 through 5 for instructions.

8. Control board 15 amp fuse blows when open/close command is given.

STEP 1 Fuses blow primarily for one reason, the gate cannot move. Causes might be something keeping the gate from moving, the gate is trying to move in the wrong direction due to incorrect limit switch setting or there might be a wiring problem. A wiring problem is most likely in a splice that might have been made during installation or it could be in the actuator housing.

STEP 2 Open the control box and locate the Patriot control board, locate the 2 LED's under the actuator connector on the control board. Press the "LED indicator" push button and hold it in, observe the LED's and determine if the open limit or close limit LED is on. Then determine if the correct LED is on for the gate position. For example if the left LED is on that is the open limit and the gate should be in the open position. The right LED represents the closed position. See note under problem 4 above.

STEP 3 If the open limit LED is on and the gate is closed if a command to operate is given the gate will try to close more, which can blow a fuse. If the close limit LED is on and the gate is opened a command to operate will try to open the gate more, which can blow a fuse. In either case the limit switches need to be adjusted and then the cause for them becoming misadjusted needs to be determined. The cause generally has to do with wiring; bad actuator plug connection at the Patriot control board or to much adjustment has been made during installation.

STEP 4 If a wiring problem is suspected the orange, white and green wires are the ones to concentrate on. Check all splices and verify actuator connector is connected at the control board.

STEP 5 If the actuator is suspected of being bad either due to an internal wiring problem or a motor problem, call the factory for further troubleshooting and return information.

9. Transmitter will not operate the gate

STEP 1 Open the control box and locate the Patriot control board. Locate the "LED Indicator" push button and the "Push Button Input" LED. Push the "LED indicator" push button and hold, then press the transmitter button and observe the "push button LED". The LED should come on while the transmitter button is depressed.

STEP 2 If the "Push Button LED" did not come on then make sure that the green J2 connector on the control board is securely connected, replace the 9 volt battery in the transmitter and verify that the dip switches located in the transmitter (above battery) are set identical to the ones located in you receiver. Remove the receiver cover by squeezing the sides and locate the switches inside.

STEP 3 If the "Push Button Input" LED in step 1 did come on and the gate did not operate then locate the "Open/Close Command" button located at the bottom center of the Patriot control board. Press the "Open/Close Command" button and note gate operation.

STEP 3 If the gate did not operate in step 3 verify that the 15-amp fuse on the Patriot control board adjacent to the actuator plug being used is not blown, (a fuse can be blown and look good) replacing is the best way to verify fuse is good.

STEP 4 If the gate did not operate in step 3 and the fuse was good in step 4 then most likely a safety accessory connected to the green J2 connector is active. Verify this by depressing the "LED Indicator" push button and observe the LED's located in the lower left corner of the Patriot control board. If a led is on identify the accessory connected to the corresponding J2 connector pin and correct the problem.

STEP 5 Other causes are possible, both the open and close limit LED's are on at the same time, if so adjust limit switches. Control board could be defective; battery could be too weak to operate the gate. Please call the factory for help identifying the cause.

10 Photo-eye, safety loop or other safety accessory will not reverse the gate when closing or hold the gate open

STEP 1 The first thing to check is the accessory wiring. The accessory needs power (+12vdc) wired to battery positive terminal or to J2 pin 1 on the Patriot control board. It also needs ground, which can be wired to the battery or to J2 pin 2 or 7 on the Patriot control board. The other two connections are the "N/O and Common ground". The common ground can be connected to the battery or to J2 pin 2 or 7 on the Patriot control board. The N/O connection must be connected to J2 pin 11 "Safety Loop / Reversing Edge Input". If the accessory is connected as described above it should reverse a closing gate or hold a gate open if the accessory is activated.

STEP 2 Now to determine if the accessory is working correctly and that the Patriot control board is receiving the signal locate the "LED Indicator" push button and the "Safety Loop / Reversing Edge Input" LED (located in the lower left corner of the Patriot control board).

STEP 3 Press and hold the "LED indicator" push button and observe the "Safety Loop / Reversing Edge Input" LED. Activate the accessory in question (if photo-eye break the beam) if the accessory is working properly the LED light should come on when the device is activated. If the device does not turn on the LED light then check wiring, J2 connector connection at the Patriot control board. If wiring is good then the accessory is not operating correctly. Repair accessory and retest.

STEP 4 If the "Safety Loop / Reversing Edge Input" LED comes on and the gate does not reverse direction when closing, call the factory for other possible causes and return information.

11 Pressing the "RESET" button only, causes the gate to operate

STEP 1 This problem is probably due to a bad receiver. First locate the "LED Indicator" push button on the Patriot control board. Then locate the "Push Button Input" LED located in the lower left corner of the Patriot control board.

STEP 2 Press the "LED Indicator" button and observe the "Push Button Input" LED. If the LED comes on then the receiver relay is stuck closed and needs to be repaired or replaced.

STEP 3 If the "Push Button Input" LED does not come on, call the factory for further troubleshooting and return information.

12

Accessory Wiring Information

USAutomatic Patriot gate operators are 12 vdc powered, solar charged operators do not require 110 vac for proper operation. Accessories that operate at 12 vdc can be connected directly to the control board or the battery. Proper accessory selection must be made so that the accessories installed do not drain the solar charged operator battery.

If accessories selected operate at 110 vac then it will be necessary to have 110 vac power located at the operator control box. Refer to local building codes and have a qualified electrician install the 110 vac power.

Types of Accessories

USAutomatic Patriot control boards are designed to operate with all accessories. Understanding the control board inputs and the desired operation of each accessory is essential when designing the gate operator system.

Safety Accessories
(Primarily used to keep gate from operating when an object is in the gate path)

Safety Loops –
Photo Eyes –
Motion Detector –

Secondary Entrapment Accessories
(Primarily used to protect people from becoming trapped in and around the gate area)

Contact Edge (wireless) –
Contact Edge (wired) –
Photo Eyes –

Convenience Accessories

Keypads –
Free Exit Device Magnetic Sensor –
Free Exit Device Photo Eye –
Card Reader -
Single Button Station –
Key Switch –
Seven-Day Timer –
Long Range Receiver and Transmitter -

Security Accessories

Magnetic Lock –
Solenoid Lock –
Stone Lock -
Perimeter Security Proximity Sensor –

Other Accessories

3 Button Station –
Gate Open Indicator –
Gate In Motion Indicator Visual –
Gate In Motion Indicator Audible –

Accessory Wiring

Before wiring accessories to the Patriot control board remove the actuator connector plug from the control board, this will disconnect power from the unit while wiring. Refer to the installation instructions provided with the accessory being installed.

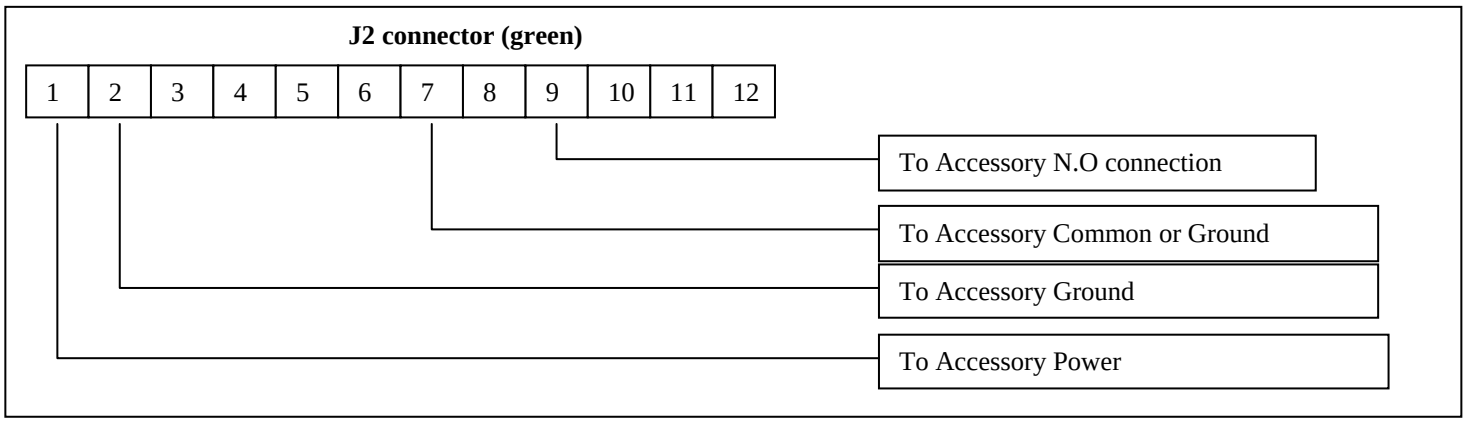
Typically the accessory will have 4 wires that we need to be concerned with (this can vary depending on the manufacturer). These 4 wires can be divided into 2 groups.

First group consisting of 2 wires are the power wires – voltage connection and ground
Second group consisting of 2 wires are the control wires- N/O connection and common ground or ground

The power connection on the Patriot control board should be made at J2 pin 1. This output is protected with an auto resetting 1.5-amp fuse. If the total current draw of all accessories exceeds 1.5 amps then it will be necessary to connect directly to the battery for additional current.

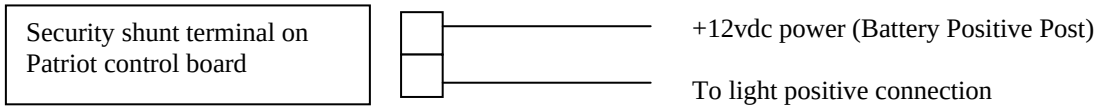
The common, common ground or ground connection on the Patriot control board is located on the J2 connector (green) pin number 2 and 7, in addition the J1pin 2 and J4 pin 2 terminals located beside the J2 connector each have a ground connection. These are clearly marked on the control board. The battery ground or – post can also be used if needed.

The N/O connection on the Patriot control board will be made to the J2 connector (green) pin, which performs the desired function. For example if installing a device with the desired function of opening the gate when the accessory is activated then it connects to J2 pin 9. If the desired function is to reverse a gate that is closing when activated then J2 pin 11. Refer to page 14 of this manual to understand J2 inputs and pin connections.



The Patriot control board has 3 outputs that can be used to perform multiple functions they are the "Security Shunt", "Solenoid lock" and the "Magnetic lock" outputs. For any of these to operate the appropriate DS2 dipswitch must be turned on.

Security Shunt – is a dry contact switch that is closed anytime the gate is not closed. A proximity switch such as the type installed in a security system to activate an alarm if the contact is broken could be wired here. If the gate is opened by an intended signal the security shunt switch closes and prevents the alarm system from activating. If the gate were forced open then the alarm would be activated. Security shunt can also be used to power +12-volt dc equipment. If the desired function is to have something turned on when the gate is not closed for example a gate open indicator light. The security shunt would be wired as below.



The light ground connection can be made directly to the battery negative post. Light will come on when the gate is not closed. This can also be used to power a Photo Eye in solar applications to reduce battery drain.

Accessory Wiring

The +12 volt dc output is protected with a 1.5 amp auto-resetting fuse.

Solenoid Lock – This is a +12 volt dc output that can output +12 volts two different ways.

1. If DS2 switch 1 is turned "on" and the DS1 switch 5 is "OFF" the +12- volt will come on a half second before the gate begins to open after activation. Once the gate begins to move the output will go to 0 volts in 4 seconds.

2. The other option is to turn DS2 switch 1 and DS1 switch 5. With this setting the solenoid lock output will be +12 volt dc a half second before the gate begins to open after activation and remain at +12 volt dc until 3 seconds after the gate is fully opened. When gate is activated to close the solenoid output will be +12 volt dc a half second before the gate begins to move and remain until 3 seconds after the gate is fully closed. For example this can be used to turn on a gate in motion siren or light.

Magnetic Lock – This is a +12 volt dc output.

Whenever the gate reaches the closed limit the +12 volt dc will be present and remain until the gate is activated to open. The +12 volt dc output will be turned "off" one half second before the gate begins to open.

Programming receiver and transmitter:

The transmitter has 2-buttons to control the 2-relays in the receiver. The 2 relays in the receiver are labeled P1 and P2. The default setting for these relays is momentary; they can be programmed to latch if desired. This option makes it possible to program the right button on the transmitter to control relay 2 which if set to the latch mode can be used to hold the gate open and override the auto close timer. The gate would then stay open until the latching relay was released by pressing the right transmitter button again.

NOTE: If latch mode is programmed and engaged it must be released using the transmitter before gate can be closed.

The transmitter contains a bank of tri-state dipswitches, which are used to individualize your system; it is highly recommended that these be changed from the factory default.

1. Open the battery compartment and locate the dipswitches, record the new setting for reference.
2. Press the P1 button on the receiver and hold until light comes on
3. While light is on press the left transmitter button, relay will click. Programming is complete.

If the latching relay 2 is to be used follow the steps below:

1. Press the P2 button on the receiver and hold until light comes on.
2. While the light is on then press the P1 button on the receiver. (This will program relay 2 into latch mode)
3. Press the P2 button on receiver and hold until light comes on (light should be blinking if step 2 worked), while light is blinking press the right button on the transmitter relay will click. Programming is complete.

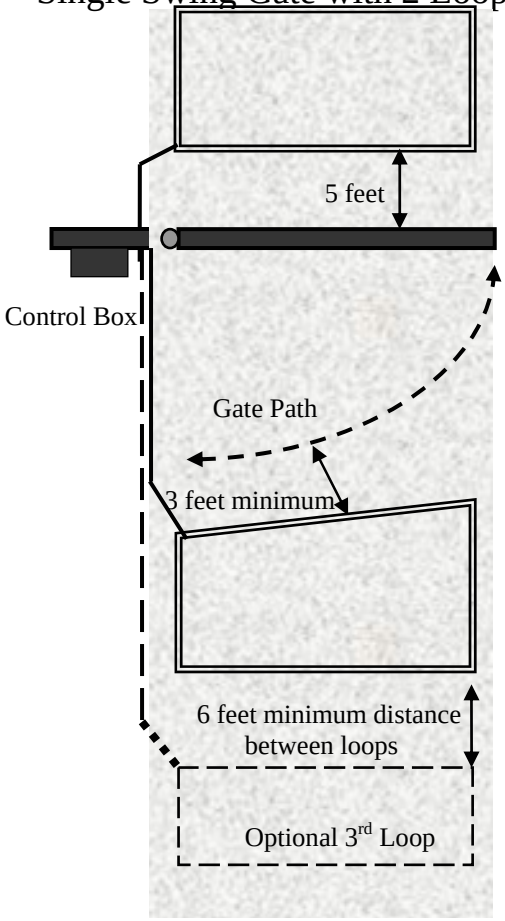
Resetting relay 2 to momentary (removing latch mode from receiver):

1. Press the P2 button on the receiver (if in latch mode light should be blinking).
2. While light is blinking press the P1 button the receiver. Relay 2 is now set to momentary.

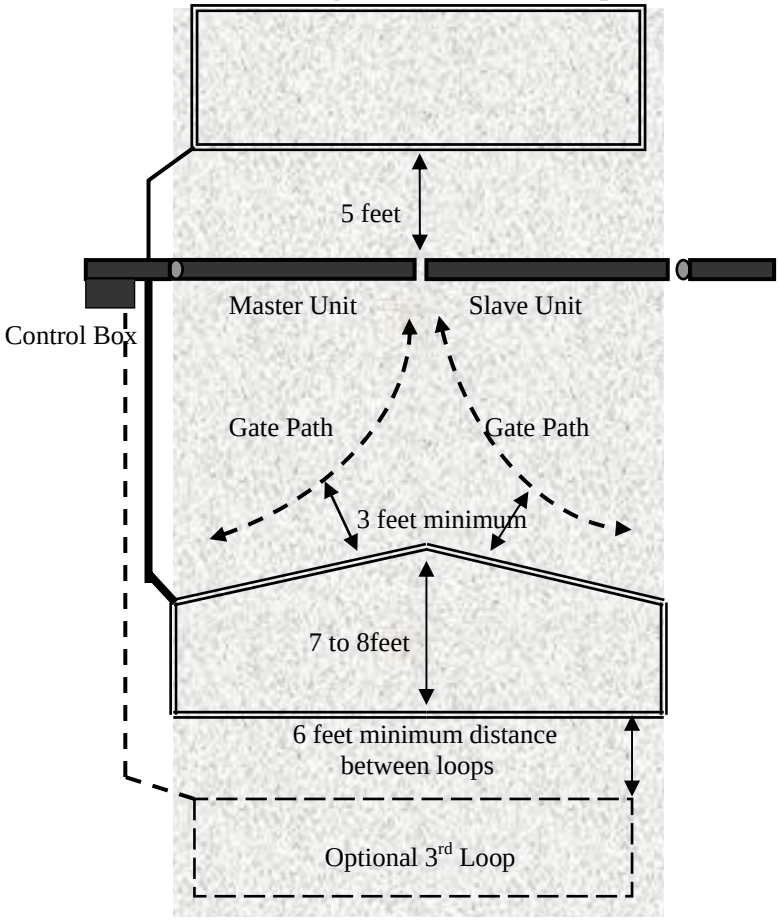
Loops

Loop Position Diagram

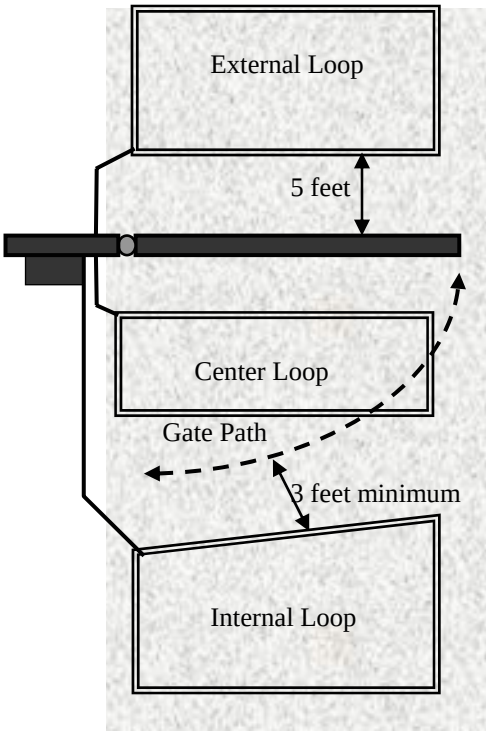
Single Swing Gate with 2 Loops



Dual Swing Gate with 2 Loops



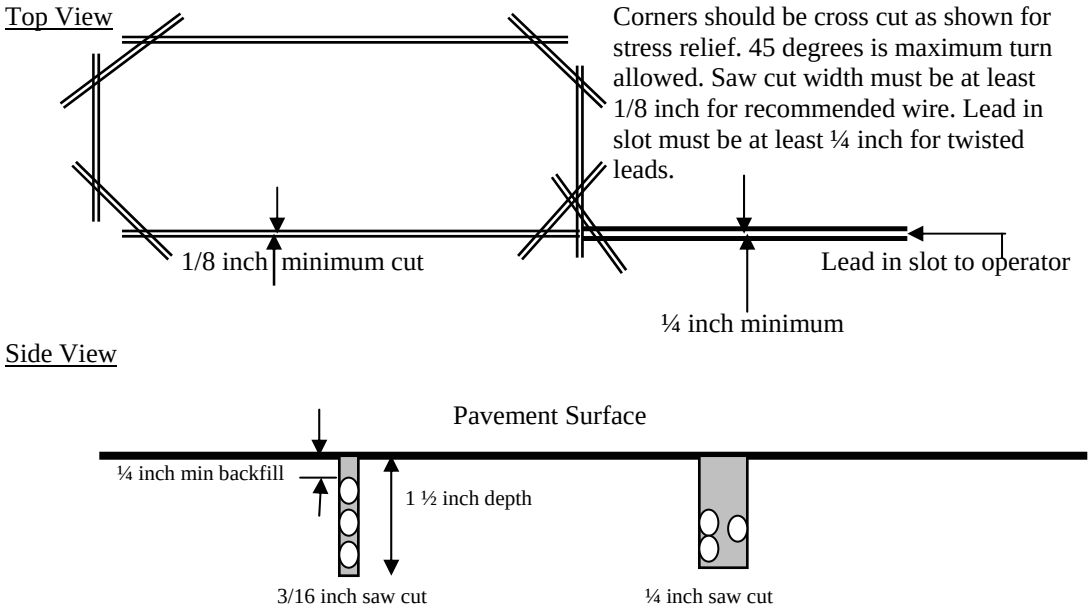
Center Loop



For larger gates, a loop can be placed directly under the gate, a separate detector is required. The loop will only be active when the gate is fully open and will ignore the signal at all other points. Consult a dealer or the factory for a complete explanation.

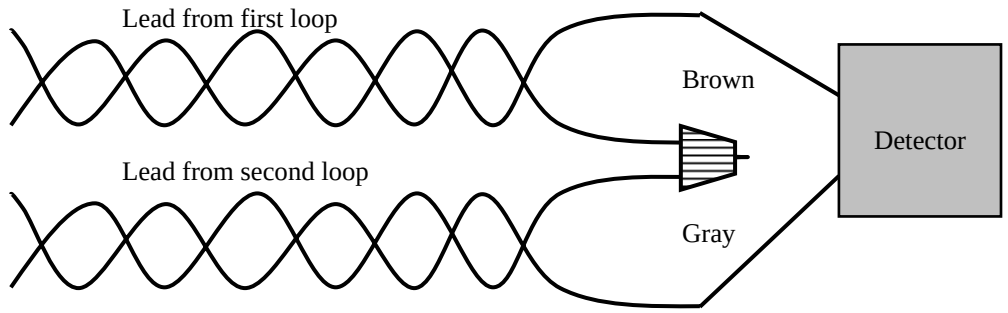
Loops

Typical Loop Saw cut


Top View
Corners should be cross cut as shown for stress relief. 45 degrees is maximum turn allowed. Saw cut width must be at least 1/8 inch for recommended wire. Lead in slot must be at least ¼ inch for twisted leads.
1/8 inch minimum cut
Lead in slot to operator
¼ inch minimum
Side View
Pavement Surface
¼ inch min backfill
1 ½ inch depth
3/16 inch saw cut
¼ inch saw cut

Proper wiring of two loops performing the same function.

Example: Inside and Outside Safety Loops



Loops

Loop Size Chart

The loop size is based on the width of the driveway. If the driveway is 14' wide, the loop would be a 6'x6', the minimum. This is determined by subtracting 4' off of each side of the drive, which would leave you 6'.

See chart below for number of turns per loop size, plus lead in.
The loop itself should contain between 90 & 125 feet of wire in the loop, plus lead in.

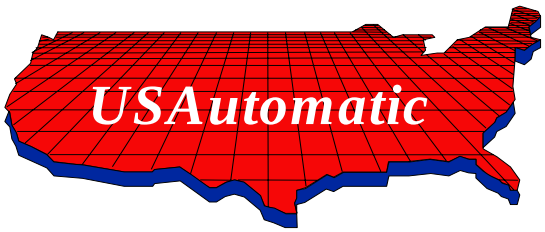
Drive Width	Loop Size	Number of Turns Per Foot		
		2	3	4
14 feet and under	6’ X 6’			96’
16 feet	6’ X 8’			112’
18’	6’ X 10’		96’	
20’	6’ X 12’		108’	
22’	6’ X 14’		120’	
24’	6’ X 16		132’	
26’	6’ X 18’	96’		
28’	6’ X 20’	104’		
30’	6’ X 22’	112’		
32’	6’ X 24’	120’		

The location of the loop is also important. If a loop is located too close to the gate, it will detect the gate itself, giving false operation. If the loop is too far away from the gate a small vehicle might not be detected. Loops should be about 5' from the centerline of a gate when closed. See Loop Position on previous 2 pages.

Loops

Other Loop Detector Facts

1. Always clean saw cuts thoroughly with water, air or brush to remove all debris prior to installing wire.
2. Recommended loop wire is TFFN #16 gauge stranded wire. Available at electric supply distributors.
3. No splices are permitted in the loop or loop leads. One continuous wire should be used.
4. Lead wires should be twisted a minimum of 4 twists per foot to eliminate false sensing. Twists should begin at the edge of the loop and continue to detector.
5. Do not use metal or sharp objects to push the loop wire into the saw cut. The slightest nick or cut in the insulation will cause the loop to ground out and malfunction. To test for shorts, use a megohm meter or "Megger" between either loop lead and earth ground with both leads disconnected from the detector. The resistance should be greater than 50 megohms.
6. Use silicon caulk for backfill. Gray for concrete, black for asphalt. 25-Year life rating is preferred.
7. Never set adjacent loops on the same frequency. False activation will occur.
8. Some brands of detectors have an external or internal sensitivity adjustment. Usually the factory setting is sufficient if internal adjust type. Be very careful and use extreme caution when decreasing sensitivity.
9. Most false activations are caused by an improperly installed loop or a shorted loop. The loop should be tested and validity determined before adjusting sensitivity. See # 5 above.
10. Most detectors used in the gate business are fail-safe. This means that if the loop fails, the gate will be given a continuous signal. When power is disconnected from a detector, the signal output is also given.
11. ASB, or automatic sensitivity boost if available should be on if large truck or trailer traffic is likely.



PATRIOT I
PATRIOT II
Limited 5 Year Warranty

The PATRIOT Gate Operator is warranted to be free of defects in materials or workmanship for a period of 5 years from date of purchase on the electronic control board and 12months on all other components. Any part, parts, or complete unit found to be defective within this period would, at the manufacturer's option be repaired or replaced at no charge if returned freight prepaid. New or factory rebuilt replacement parts are warranted for the remaining portion of the original warranty period. The manufacturer will pay for standard ground freight on the return of the repaired or replaced items under this warranty. The manufacturer will not be responsible for field service or labor charges incurred in the removal or replacement of defective parts. Furthermore, the manufacturer will not be responsible for incidental or consequential damages.

This warranty is in lieu of all other warranties expressed or implied and shall be considered void if damage was due to improper use or installation, connection to an improper power source, or if caused by fire, flood, lightning and other acts of nature, or by vehicles or vandalism.

This warranty gives you specific legal rights, and you may have other rights, which vary from state to state. Some states do not allow limitations or exclusions of implied warranties so these may not apply to you.

Keep this portion for your records

Model:_____ **Serial Number*:**_____

Date of Purchase:_____ **Purchased from:**_____

CUT HERE

RETURN THIS PORTION TO:
USAutomatic, LTD
118 Hillside Drive
Lewisville, Texas 75057
Toll Free 1-888-204-0174

Model: _____ Date of Purchase: _____
Serial #: _____ Purchased from: _____
Name: _____
Address: _____
City: _____ State: _____ Zip: _____

- Serial number can be found by removing cover and looking on control board.